NOVA IMS Information Management School

MEGI

Mestrado em Estatística e Gestão de Informação

Master Program in Statistics and Information Management

BANCO INVEST. S.A. – EQUITY VALUATION

Maria Teresa Saraiva de Aragão da Silva Dória

Dissertation presented as partial requirement for obtaining the Master's degree in Statistics and Information Management

NOVA Information Management School
Instituto Superior de Estatística e Gestão de Informação

Universidade Nova de Lisboa

NOVA Information Management School
Instituto Superior de Estatística e Gestão de Informação
Universidade Nova de Lisboa

BANCO INVEST, S.A. – EQUITY VALUATION

by

Maria Teresa Saraiva de Aragão da Silva Dória

Dissertation presented as partial requirement for obtaining the Master's degree in Statistics and Information Management, with a specialization in Risk Analysis and Management

Advisor: Prof. Dr. Jorge Miguel Ventura Bravo

November 2020

ACKNOWLEDGEMENTS

The conclusion of this Master Thesis represents the end of the hardest, most rewarding and challenging chapter I have ever lived. It also represents the result of an academic background filled with dedication, arduous work and spirit of self-sacrifice, which would not have been possible without the support and motivation from my closest family and friends.

To my parents and sister Rita, for conceding me the opportunity to study the matters of my interest, for the chance to move to Lisbon to pursuit a dream and for always backing up my decisions during my all life. I could never be the person I am without their constant support, love and cheering. Specially to my mother, for being my best friend no matter what, and to whom I dedicate this work to which she contributed, helped and taught so much, always with something good to say.

To my family, specially Avô Aragão, Avó Ruca, Tio Pê, Tia Bel, Tio Paulo, Marta and Margarida for always believing me and being so present and supportive during the Master.

I must thank my boyfriend Frederico, for his unconditional love and all the help, support and motivation during the Master and specially the Master Thesis and never giving up on me and my work.

I also want to express my gratitude to my roommate Luísa for all the friendship and understanding at all moments through the Master, without her tranquility and support I could never have finished this project.

To my friends from Porto, especially Beatriz Fonseca, for all their lifelong support and for having faced this challenge with me, just as they always did, and I know they will continue to do so.

To all my friends and colleagues at Nova IMS, specially Beatriz and Maria, for all the friendship, help and mutual assistance through the Master and Master Thesis.

And last, but not least, I want to express my gratitude to my supervisor Professor Jorge Miguel Ventura Bravo for never giving up on me and for his continuous support and constant advices.

ABSTRACT

Banco Invest S.A. (or “Banco Invest”) is an anonymous society based in Lisbon and six branches in Portugal: Lisbon, Porto, Leiria and Braga.

The Bank initiated its activity as Banco Alves Ribeiro S.A. in 1997. However, in order to unequivocally reflect its mission, there was a change in the bank’s name to Banco Invest. This mission is essentially to be recognized by the market as the financial institution that best meets the needs of customers, individuals, companies or institutions, in all financial products available, proposing solutions that traditional retail banking, with a more standardized offer, is not designed to offer.

Banco Invest specializes in managing savings and investments of its private, corporate and institutional clients, offering an open and independent structure, with a global and diversified set of products and services. Therefore, one of the goals of this thesis is to better understand how private and investment banking has been playing in the financial institution’s markets through the years.

During the last decades, diverse mechanisms of business valuation models were created. These valuation methods aim to achieve with the greatest degree of accuracy, the intrinsic value of a financial institution. Generally, there is no right answer to the problem of valuation of companies. After all these years, there are no specific assumptions to be made neither what are the most suitable methods to follow.

Throughout this dissertation, the main purpose is to identify and study different methodologies such as: (i) discounted cash flows, (ii) relative valuation, (iii) liquidation and accounting valuation and also (iv) contingent claim valuation, in order to achieve a final price per share that can be compared to the one offered by Banco Invest and bring another perspective to this matter.

I will intend to value the Banco Invest SA as of 31st of December of 2019, the last revised Annual Report available, and compare it to the final price per share offered by the market. The forecasts will be estimate for the following 4 years (2020-2023).

At 31-12-2019 Banco Invest was slightly undervalued, the market price was € 5,00 and the target price calculated was € 5,46, our recommendation is to "Buy".

KEYWORDS

Financial Institutions; Banco Invest SA; Financial Firm Valuation; Free Cash Flow to Equity (FCFE); Intrinsic Value

INDEX

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS AND ACRONYMS

Banco Invest	Banco Invest S.A.
n	Life of the Asset
CF_t	Cash Flow in period t
r	Discount rate reflecting the riskiness of the estimated cash flows
FCFF	Free Cash Flow to the Firm
FCFE	Free Cash Flow to Equity
EBIT	Earnings Before Interest and Taxes
WACC	Weighted Average Cost of Capital
TV	Terminal Value
g	Growth rate the CF is expected to grow during the TV
MV(Equity)	Current market value of equity
MV(Debt)	Current market value of debt
K*e*	Cost of equity
K*d*	Cost of debt
DDM	Dividend Discount Model
E(DPS)	Expected Dividend per Share
DPS_1	Expected dividend one year from now
DPS_t	Expected dividends per share in year t
V_u	Unlevered company's shareholder's equity
PV_{TS}	Present Value of tax benefits from debt
EVA	Economic Value Added
CAPM	Capital Asset Pricing Model
E(Ri)	Expected return of the asset in equilibrium
R*f*	Risk-free rate
β*i*	Asset sensitivity to the market
$E(R_M)$	Expected return on the market portfolio

$E(R_M) - Rf$	Expected return on the market portfolio over risk free bonds
CRP	Country Risk Premium
R*i*	Return on an asset
R_M	Return on the market portfolio
GDP	Gross Domestic Product
USA	United States of America
ECB	European Central Bank
IMF	International Monetary Fund
BES	Banco Espírito Santo
Banif	Banco Internacional do Funchal
EC	European Commission
NPL	Non-Performing Loans
ROE	Return on Equity
ROA	Return on Assets
LCR	Liquidity Coverage Ratio
RWA	Risk Weighted Asset
CET1	Common Equity Tier 1 ratio

1. INTRODUCTION

Banco Invest S.A. (or "Banco Invest") is an anonymous society based in Lisbon and six branches in Portugal: Lisbon, Porto, Leiria and Braga. The Bank initiated its activity as Banco Alves Ribeiro S.A. in 1997. However, to unequivocally reflect its mission, there was a change in the bank's name to Banco Invest. This mission is essentially to be recognized by the market as the financial institution that best meets the needs of customers, individuals, companies or institutions, in all financial products available, proposing solutions that traditional retail banking, with a more standardized offer, is not designed to offer.

Banco Invest specializes in managing savings and investments of its private, corporate and institutional clients, offering an open and independent structure, with a global and diversified set of products and services. Therefore, one of the goals of this thesis is to better understand how private and investment banking has been playing in the financial institution's markets through the years. The Bank currently has six major business areas: Asset Management, Brokerage, Specialized Credit, institutional custody, corporate finance and treasury and capital markets (*Annual Report Banco Invest 2019*). Banco Invest is a bank with constant changing in its products and target clients. Therefore, one of the goals of this thesis is to better understand how private and investment banking has been playing in the financial institution's markets through the years.

With the aim to bring more worth to this thesis, I will intend to value Banco Invest SA as of 31st of December of 2019, the last revised Annual Report available and compare it to the final price per share offered by the market. The valuation to be performed will be based on the historical data from 2014 to 2019 presented by Banco Invest in their financial statements from the annual reports of each year. The forecasts will be estimate for the following 4 years (2020-2023).

Valuation of a financial institution is a very complex process which primary goal is to determine its value in a certain period. Due to the complexity and distinctiveness of financial institutions, such as the one chosen in this proposal, I will analyze the different methodologies and models used to evaluate a financial firm with high level of caution and detail (Viebig et al., 2008). However, this study will not have a right and straight forward answer because as Damodaran said, "*valuation is neither the science that some of its proponents make it out to be nor the objective search for true value that idealists would like it to become*" (Damodaran, 2012, page 2).

According to Damodaran (2009b), there are two main characteristics that lead to valuing financial firm problems:

(i) Cash flows from a financial firm cannot be easily determined since there are some items such as capex, working capital and debt that are not easily defined;

(ii) Financial institutions are under a regulatory framework that controls how entities are capitalized, where they do their investments and how they grow.

Due to all the mentioned above, this thesis aims to form an understanding on how Banco Invest S.A. has been performing during the years and to estimate the price per share of Banco Invest S.A..

Through this thesis I will present valuation models used by different authors in order to discover the most appropriate to perform and equity research to Banco Invest S.A..

2. LITERATURE REVIEW

2.1. FINANCIAL FIRM DEFINITION

To start our study, the first thing to do is to define a financial firm.

According to Damodaran (2009b) a financial service firm can be described as an institution that provides financial services and products to the market, being this market either individual consumers or other companies. We can divide the financial service business into four different groups giving its major goal: commercial banks, insurance companies, investment banks and investment firms.

"*A bank makes money on the spread between the interest it pays to those from whom it raises funds and the interest it charges those who borrow from it, and from other services it offers it depositors and its lenders.*"(Damodaran, 2009, page 2).

Insurance companies generate income through premiums received from insurers who seek for protection and from its own investment portfolios in order to face the possible services claims to paid to clients (Damodaran, 2009b).

Investment banks have a totally different aim from commercial banks: the customers they provide services are mainly big companies with substantial capital and with low probability of default due to its dimension or ultimate parent companies. These services mentioned before are essentially products to exchange in the financial markets or to consummate deals such as merge and acquisitions of other companies of its sector. Investment banks income comes mainly from advisory and management fees for investment portfolios (Damodaran, 2009b).

2.2. VALUATION PURPOSE

Financial Institutions, businesses, firms or their assets can be valued due to an ensemble distinct reasons such as Mergers and Acquisitions, Litigation and Ownership disputes, Employee Stock Ownership Plans (ESOPs), Financial Reporting, Buy or Sell Agreements, Stock Option Plans or Business Planning (Hitchner, 2011). According to Damodaran (2012) valuation plays an useful role in different areas of the financial world, mainly in valuation in (I) Portfolio Management, (II) Mergers and Acquisitions and (III) Corporate Finance.

(I) Portfolio Management: Valuation has different roles in portfolio management according y the type of investor in consideration. Valuation plays a much more important and critical role for an active investor rather than for a passive investor (Damodaran, 2012).

(II) Merger and Acquisitions: Valuation has a central role in determine the final fair value of the firm. "*The bidding firm has to decide on a fair value for the target firm before making a bid, and the target firm has to determine a reasonable value for itself before deciding to accept or reject the offer*" (Damodaran, 2012, page 27). However, the fair value for each part can be different given to consideration the expectations of the buyer/seller.

(III) Corporate Finance: In the words of Damodaran (2012), the main goal in corporate finance is the maximization of a firms value. It is essential to clearly understand how to value a company as it can be related to the dividends policy, on which project to carry on or the ones less profitable and what are the main sources of value creation and destruction of a firm.

Valuation is not an objective and precise exercise and every study, idea or biases that an analyst uses in the valuation process should be considered because it will find their way into making a point in the valuation. And even the best valuation is a rough approximation of the true value of a company, with a substantial likelihood of being erroneous.

2.3. FINANCIAL FIRM CHARACTERISTICS

Financial institutions have four key characteristics:

(i) Due to its risk and influence in global economy, financial firms are under very strict regulatory rules about their capital ratios, their investment choices and way of generating income;

(ii) Secondly, accounting rules for income and asset values are exclusive for financial firms, making them completely different from the rest of the market;

(iii) The third is that debt of a financial service firm is not very similar to a source of capital for non-financial firms, i.e., for non-financial firms its debt is considered a source of capital but, on the other hand, for financial institutions debt can be transformed in complex products to insert in the market and even generate more profit; and

(iv) Last but not least, estimating future cash flows for a bank may be impossible to compute (Damodaran, 2009b).

According to Damodaran (2009a), a financial company is an institution that provides financial products and services to both individual and collective consumers. Within the scope of financial companies there are commercial banks, insurance companies, investment banks and investment companies. While commercial banks do the encounter of savings of certain individuals and the borrowing needs of others, insurers seek to protect customers and their own investment portfolio to cope with adverse situations. In the case of investment banks, according to the author, their main objective is to provide services to large companies, focusing on operations in the financial market.

When financial institutions act as intermediaries, they transfer savings from savers to economic agents who need resources to finance their investments. On the other hand, according to Allen (1990), in addition to intermediation and participation in financial transactions, financial institutions collect information about assets and investments, in order to inform investors and guarantee the quality of investments made by their clients.

Currently, there is a great global interconnection between all entities and with these financial institutions are even more influenced by the laws and regulations of the country in which they are located. This laws and regulations are very relevant to improve the information available and to reduce transaction costs (Ross Levine & Beck, 2000).

In the words of Ross Levine (2005), financial institutions have the characteristic of producing information about possible investments, with the goal of reducing information asymmetry. On the other hand, financial companies transfer economic resources in time and space, to obtain a higher rate of return and supervise investments after the granting of loans. Another important feature refers to risk management, carried out through the diversification of resources. In addition, these companies ensure savings in the most efficient way possible and facilitate the exchange of goods and services through a means of payment, a fact that would not have been possible without their existence or being possible was a process that was hampered.

2.4. Valuation Methods

Along with Damodaran (2006) there is a consensus in the finance world that there are four approaches to valuation. The valuation models can be separated in the following groups:

I. Discounted Cash Flow Valuation: relates the value of an asset to the present value of expected future cashflows on that asset at a specific rate of return.

II. Relative Valuation: estimates the value of an asset by looking at the pricing of comparable assets relative to a common variable such as earnings, cash flows, book value or sales.

III. Liquidation and Accounting Valuation: valuing a firm with accounting estimates of value or book value as a starting point. It values a company from a static point of view and does not value potential earnings.

IV. Contingent Claim Valuation: uses option pricing models to measure the value of the assets of a firm that share option characteristics.

Valuation Methods			
Discounted Cash Flows	**Relative Valuation**	**Liquidation and Accounting Valuation**	**Contingent Claim Valuation**
Free Cash Flow to Firm	Price Earning Ratio	Book Value	Black-Scholes
Free Cash Flow to Equity	EV to EBITDA	Adjusted Book Value	Binomial Value
Dividend Discount Model	Equity Value	Liquidation Value	
Adjusted Present Value	Price to Sales	Substantial Value	
Economic Value Added	Price to Book Value		
	Other Multiples		

Table I - Valuation Methods; (Deev, 2011) and (Damodaran, 2006)

In the next chapters I will be presenting and discussing some of these valuation methods to justify the choice of the valuation method that will be used in my equity research.

2.4.1. Discounted Cash Flow Valuation

Discounted Cash Flow Valuation considers the intrinsic value of an asset as the present value of its expected future cash flows. If it includes dividends, the Discount Cash Flow model turns into the Dividend Discount Model (DDM) (Pinto et al., 2010).

Cash flows differ asset to asset, such as, coupons, face value for bonds, dividends, etc. Then, the discount rate used will be proportionally to the risk of the estimated cash flows, leading to higher rates for riskier assets and, on the other hand, lower discount rates for risk free assets (Damodaran, 2012). Therefore, the present value of an asset is the future expected cash flow discounted at determined rate that reflects the risk the asset has in the balance sheet of the financial institution (Damodaran, 2006).

This model can be performed discounting the future expected cash flows to equity at the cost of equity or by discounting the expected cash flows to the firm at the weighted average cost of capital (Damodaran, 2012).

However, it presents some difficulties. Since debt of a financial institution is a very complicated computation and hard to define or measure, it causes some restrictions in the estimation of the firm value or costs of capital. Another downside of Discounted Cash Flow is that most of the reinvestment a financial institution performs occurs under operating expenses, making it difficult to compute capex and working capital amounts. Also, Damodaran believes that regulatory entities, central banks or other regulators make constraints in the potential returns that a financial firm may be able to achieve (Damodaran, 2012).

Another consideration we should have in this model is the amount of provisions for possible future losses that banks register in their financial statements. Provisions represent an amount that reduces the net income value to meet expected losses in future periods. In a year where the bank faces a high default rate, this amount prevents the financial statements to suffer a strong shake. But, on the other hand, in years where the customers defaults are lower than provision amount, banks will have a reduce in its net income with no necessity. In this case financial institutions set aside an amount too high and will lead the financial statements, more precisely the net income, to show an understated net income which will also influence and lead to a lower return on equity and capital ratios (Damodaran, 2012).

As mentioned before and according to Damodaran (2012), the value of any asset corresponds to the present of expected future cash flows on it.

$$Value = \sum_{t=1}^{n} \frac{CF_t}{(1+r)^t} \tag{1}$$

Where

n – Life of the Asset

CF_t – Cash Flow in period t

r – Discount rate reflecting the riskiness of the estimated cash flows

2.4.1.1. Free Cash Flow to the Firm

Free Cash Flow to the Firm is a valuation model with focus on cash generation. It is computed considering the present value of a firm's expected earnings in the future, reflecting the amount that will be left to investors (all claim holders and not only the shareholders). Fundamentally, the FCFF is the amount of cash flow available to the stockholders after all operating expenses (including taxes) have been paid, reinvestment in working capital and fixed capital has been made but before any debt payments.

$$FCFF = After - tax\ Operating\ Income - (Capital\ Expenditures - Depreciation) - Change\ in\ non - cash\ Working\ Capital \quad (2)$$

According to Damodaran (2012) we can compute the FCFF in two different ways: the first is by adding the cash flows that concern to the claim holders that are not included in the Free Cash Flow to Equity (FCFE).

$$FCFF = FCFE + Interest\ Expenses\ (1 - Tax\ Rate) + Principal\ Repayments - New\ Debt\ Issues + Preferred\ Dividend \quad (3)$$

However, a simpler way is to estimate the cash flow generated by the firm's operations net of reinvestment needs that would be as follows.

$$FCFF = EBIT\ (1 - Tax\ Rate) + Depreciations - Capital\ Expenditures - \Delta\ Working\ Capital \quad (4)$$

In order to compute the firm's fair value, it is necessary to add all the free cash flows along with the terminal value and discounting them at the rate that reflects its risk, the Weighted Average Cost of Capital since it already includes the cost of equity and the after-tax cost of debt.

$$Enterprise\ Value = \frac{FCFF_1}{1 + WACC} + \frac{FCFF_2}{(1 + WACC)^2} + \cdots + \frac{FCFF_n + TV_{n+1}}{(1 + WACC)^n} \quad (5)$$

$$TV_{n+1} = \frac{FCFF_n * (1 + g)}{WACC - g} \quad (6)$$

Where,

FCFF – Free Cash Flow to the Firm

WACC – Weighted Average Cost of Capital

TV – Terminal Value

g – Growth rate the CF is expected to grow during the TV

The Weighted Average Cost of Capital (WACC) represents the rate of return required by debt holders (K*d*) and equity holders (K*e*) due to investing their funds in the firm instead of others with similar risk, showing us the firm's opportunity cost of funds (Koller et al., 2015).

$$WACC = \frac{MV\ (Equity)}{MV\ (Debt) + MV(Equity)} * K_e + \frac{MV(Debt)}{MV(Debt) + MV(Equity)} * K_d * (1 - Tax\ Rate) \quad (7)$$

Where,

MV(Equity) – current market value of equity

MV(Debt) – current market value of debt

K*e* – cost of equity

K*d* – cost of debt

The ratios of MV(Debt) and MV(Equity) to the total market value of debt plus equity define the weights in the WACC formula.

2.4.1.2. Free Cash Flow to Equity

The Free Cash Flow to Equity is considered the amount of money generated by the bank after all operating expenses, interest, and principal payments were paid and all necessary investments where made. Therefore, it indicates how much cash can be paid to the shareholders, but not necessarily the amount paid in dividends (Damodaran, 2012). The value of equity can be computed by discounting the FCFE at the required rate of return on equity for a specific level of risk (Pinto et al., 2010).

The main difference between this model and the previous one is that FCFF is computed before taking any debt payments, on the contrary FCFE is calculated after interest payments and debt cash flows.

$$Enterprise\ Value = \sum^{t=\infty} \frac{FCFE_t}{(1 + K_e)^t} \quad (8)$$

$$Enterprise\ Value = \sum^{t=n} \frac{FCFE_n}{(1 + K_e)^n} = \frac{FCFE_1}{(1 + Ke)} + \frac{FCFE_2}{(1 + K_e)^2} + \cdots + \frac{FCFF_n + TV_{n+1}}{(1 + K_e)^n} \quad (9)$$

$$TV_{n+1} = \frac{FCFE_n * (1 + g)}{K_e - g} \quad (10)$$

Being:

FCFE – Free Cash Flow to Equity

K*e* – cost of equity

TV – Terminal Value

g – grow rate the cash flow is expected to grow during terminal value.

Giving the fact that FCFE is the cash flow remaining for shareholders after all other expenses have been satisfied, discounting it by the required rate of return on equity, we reach the value of the firm's equity. Dividing the total value of equity by the number of outstanding shares gives us the value per share (Pinto et al., 2010).

To calculate the FCFE we start with the Net Income, which is the shareholders' earnings, and subtract all the cash outflows (Net Capital Expenditures and Debt Repayments) and add the cash inflows (decreases in Non-cash Working Capital and New Debt Issued) expressed in the following formula.

$$FCFE = Net\ Income + Depreciation - Net\ Capital\ Expenditures - \Delta\ in\ non - cash\ Working\ Capital - (Debt\ Repaid - New\ Debt\ Issued) \quad (11)$$

As mentioned before, in the Free Cash Flow to Equity estimation working capital and capital expenditures are two components really hard to compute (Damodaran, 2009b). In financial institutions, the reinvestment normally is not about fixed assets, equipment or plants, but instead the investment in regulatory capital. Therefore, Damodaran (2009b) suggests to adapt this model according to the regulatory authorities requirements of levels of capital ratios in order to maintain their operations within the future growth limits.

$$FCFE_{Financial\ Firms} = Net\ Income - Reinvestment\ in\ Regulatory\ Capital \quad (12)$$

In order to estimate the Reinvestment in Regulatory Capital we must determine the Book Equity Capital Ratio, that will give us the amount of investment, and the Profitability of the Activity so that we can achieve the debt amount in terms of net income.

2.4.1.3. Dividend Discount Model

Dividend Discount Model is the oldest variant of discounted cashflow models. Many analysts stopped using this model due to the premise that its yield estimation of value is too far conservative, being unable to show the true fair value of the asset (Damodaran, 2006).

According to Damodaran (2006) the value of a stock is computed by the present value of the expected dividends on that stock through infinite.

When acquiring bonds or stocks, investors are expecting to earn two types of cashflows: dividends through the all period and an expected cash flow according to the price for selling the stock at a certain point in the future.

$$Value\ per\ Share\ of\ Stock = \sum^{t=\infty} \frac{E(DPS_t)}{(1+K_e)^t} \quad (13)$$

Where,

E(DPS) – Expected Dividend per Share

K*e* – cost of equity.

Since it is not possible to estimate the amount of dividends to be receive in the future, Gordon and Shapiro (1956) came up with a model to value a stock at a constant growth rate, meaning a sustainable rate to infinity, also known as Gordon Growth Model:

$$Value\ per\ Share\ of\ Stock = \frac{DPS_1}{K_e - g} \tag{14}$$

Where,

DPS_1 – Expected dividend one year from now

K*e* – required rate of return for equity investors

g – stable growth rate through perpetuity.

Damodaran (2006) calls for attention when computing the growth rate since this rate cannot exceed the growth rate of the economy and should be consistent will the banks other measures of performance.

Later, it was developed a more flexible model called the Two-stage Dividend Discount Model that allows us to value a firm in two different periods. The first period characterized by an unsustainable or irregular growth until a certain point in the future and then a stable growth that it is expected to last for infinity.

$$Value\ per\ Share\ of\ Stock = \sum^{t=\infty} \frac{DPS_t}{(1+K_e)^n} + \frac{DPS_{n+1}}{(K_e - g) * (1+K_e)^n} \tag{15}$$

Where,

DPS_t – Expected dividends per share in year t

K*e* – cost of equity

g – stable growth rate through perpetuity after year n.

The major advantage of this model is that is very easy to apply on banks, financial institutions and insurance companies due to its constant over time earnings patterns and returns on investments.

Even though it is considered an old-fashioned model, it has been used to evaluate financial services firms, since it solves the hard problem of reinvestments in Discounted Cash Flow Valuation method.

2.4.1.4. Adjusted Present Value

The Adjusted Present Value is computed by the sum of (i) the value of the firm assuming that debt is not used and (ii) the net present value of debt effects on the firm value. It is estimated by discounting the Free Cash Flow to the Firm with the assumption of no debt at the unlevered cost of equity (Pinto et al., 2010). This approach is better used in firms whose capital structure are expected to change in the future and withdraws the sense of using constant WACC to discount the future cash flows.

To value a company through the APV method we use the value of an institution financed exclusively with equity (as mentioned before, by discounting the FCFF at the unlevered cost of equity) and sum the net effect of the investing decisions (benefits and cost of borrowing debt).

As Damodaran (2012) and Fernández (2002) agreed, the Adjusted Present Value approach states that the firm value is equal to the company's shareholder's equity, assuming it is 100% financed with equity, plus the present value tax benefits from debt and the expected bankruptcy costs.

$$Value = V_u + PV_{TS} + Expected\ bankruptcy\ costs \tag{16}$$

Where,

V_u – Unlevered company's shareholder's equity

PV_{TS} – Present Value of tax benefits from debt

Therefore, in this approach we split the effects on the value of assets and the value of debt financing, i.e., APV approach attempts to estimate the expected dollar value of debt benefits and costs separately from the value of the operating assets (Damodaran, 2006).

The best way to compute PV_{TS} is as showed in the following equation by discounting the tax savings during the first year at Kd and for the followings at Ku, which is the cost of capital for the unlevered firm:

$$PV_{ts} = \frac{D * T * K_d * (1 + K_u)}{(1 + K_d) * (K_u - g)} \tag{17}$$

In accordance with Damodaran (2012) the expected bankruptcy cost can be computed as follows:

$$Expected\ Bankruptcy\ Costs = Profitability\ of\ Bankruptcy\ Costs * Present\ Value\ of\ Bankruptcy\ Costs \tag{18}$$

To compute the Profitability Bankruptcy Costs it is usually used a bond rating's company at each level of debt. The Present Value of Bankruptcy Costs shows a lot of difficulties to be computed since represents lost opportunities of the company.

2.4.1.5. Economic Value Added

Economic Value Added is an Excess Return model that shows the present value of a project future cash flow free from investment needs (Damodaran, 2012). This model is an extension of the net present

value rule. The net present value is the present value of the economic value added by that project over its life (Damodaran, 2006).

EVA is computed as the product of the excess return and the capital invested. Damodaran (2006) explains that "*the dollar surplus value created by an investment or a portfolio of investments*", and it is expressed by the following equation:

$$EVA = (Return\ on\ Invested\ Capital - WACC) * (Capital\ Invested) \\ = After - tax\ operating\ income - (WACC * Capital\ Invested) \tag{19}$$

$$Enterprise\ Value = Invested\ Capital + \sum^{t=\infty} \frac{EVA_t}{(1+WACC)^t} \tag{20}$$

This approach uses three main inputs: (i) the return on capital earned on investments, (ii) the cost of capital for those investments and (iii) the capital invested in them (Damodaran, 2012).

2.4.2. Relative Valuation

In relative valuation, also referred as market-based valuation, the value of a firm is estimated by looking at the prices of comparable firms in the market with common variables such as earnings, cashflows, book value or sales (Damodaran, 2006). The comparable information used will include similar historical growth rates and risk profiles (Deev, 2011).

There are three essential steps in relative valuation:

(i) finding comparable assets or stocks that are priced by the market;

(ii) scaling market prices to a common variable to generate standardized prices that are comparable. In bank context, this generalization usually requires the conversion of market value of equity or firm into multiples of earnings, book value or revenues;

(iii) adjusting for differences across assets when comparing their standardized values.

"*In relative valuation, we are making a judgment on how much an asset is worth by looking at what the market is paying for similar assets. If the market is correct, on average, in the way it prices assets, discounted cash flow and relative valuations may converge. If, however, the market is systematically over pricing or underpricing a group of assets or an entire sector, discounted cash flow valuations can deviate from relative valuations.*" (Damodaran, 2006, page 58).

The three most widely and commonly used multiples are price earnings ratios, price to book value ratios and price to sales ratios. Because revenues are not a reliable measure for financial firms, price to sales ratios should not be used.

Multiple	Fundamental Determinants
Price Earnings Ratio	Expected Growth, Payout, Risk
Price to Book Equity Ratio	Expected Growth, Payout, Risk, ROE
Price to Sales Ratio	Expected Growth, Payout, Risk, Net Margin
EV to EBITDA	Expected Growth, Reinvestment Rate, Risk, ROC, Tax Rate
EV to Capital Ratio	Expected Growth, Reinvestment Rate, Risk, ROC
EV to Sales	Expected Growth, Reinvestment Rate, Risk, Operating Margin

Table II - Fundamentals Determining Equity Multiples; (Damodaran, 2006)

(a) Price Earnings Ratio

$$Price\ Earnings\ Ratio = \frac{Price\ per\ Share}{Earnings\ per\ Share} \tag{21}$$

As we can see above, the PER is a function of three variables: the expected growth rate in earnings, the payout ratio and the cost of equity. This ratio should be higher for firms with higher expectations on earnings growth and payout ratios and lower costs of equity.

However, this ratio as a specific issue when considering financial firms. Banks must include provisions in its balance sheet for bad loans or probability of default of clients. These provisions reduce the assets side and the bank's income and consequently the reported price earnings ratio. Therefore, more conservative and cautious banks will report lower earnings and have higher price earnings ratios, whereas audacious banks will present higher earnings and lower price earnings ratios (Damodaran, 2009b).

(b) Price to Book Value Ratio

$$Price\ to\ Book\ Value\ Ratio = \frac{Price\ per\ Share}{Book\ value\ of\ equity\ per\ Share} \tag{22}$$

Higher growth rates in earnings, higher payout ratios, lower costs of equity and higher returns on equity will reach higher price to book ratios. Of these four variables, the return on equity has the biggest impact on the price to book ratio.

2.4.3. Liquidation and Accounting Valuation

According to Damodaran (2006), the value of a business is represented by the sum of the values of all assets owned by the business.

This approach has its roots in accounting and builds on the notion that there is significant information in the book value of a firm's assets and equity (Damodaran, 2006).

Is built around the value of the existing assets of a firm; therefore, this method values the company from a static point of view and does not value potential earnings.

2.4.4. Contingent Claim Valuation

Contingency Claim Valuation states that the value of an asset is contingent on the occurrence or nor of an event. This approach uses option pricing models to measure the value of assets with option characteristics such as Black-Scholes-Merton model and binomial models.

A contingent claim or option is a claim that pays off only under certain contingencies, such as the value of the underlying assets is less than a predefined value for a put option or exceeds the that value for a call option (Damodaran, 2012).

The Black-Scholes-Merton model has six crucial factors to be computed: the current price of the underlying stock, the dividend yield of the underlying stock, the option strike price, the risk-free rate over the life of the option contract, the time remaining until option expiration, and the price volatility of the underlying stock (Deev, 2011).

However, this model has some shortcomings: (i) ignores dividends, (ii) assumes that options cannot be exercised early and (iii) is abstracted from reserve requirements, minimum capital requirements and other regulatory factors (Damodaran, 2012) and (Deev, 2011).

Additionally, since the 1970's that option theories have been considered a promising valuation approach, nevertheless business choices are more complex than a single option.

Because is not normally used for valuing stock value of banks or financial institutions, this method will not be applied or discussed.

2.5. THE DCF VALUATION

Cash flow appears as the difference between the number of currency units entering the company and the number of currency units leaving, and it is necessary to verify the following equality:

$$Cash\ Flow = Cash\ Flow\ for\ Shareholders + Cash\ Flow\ for\ Lenders \tag{23}$$

Equality indicates that the cash flow generated by the bank's activity, called free cash flow, is channeled to lenders and shares. Free cash flow appears as the remaining component of the bank after payment of all operating expenses, taxes and all current and non-current investments, necessary for the bank's growth and survival. In this way, the operating cash flow can be written as follows:

$$Operating\ Cash\ Flow = Operating\ Income + Depreciation/Amortization - Taxes \tag{24}$$

The cash flow indicated results from the bank's daily activities, not including additional financial expenses, since they are not considered to be operational. In addition, it is necessary to add depreciation/amortization because, although they are expenses that should be accounted for, they do not represent real cash outflows for the bank. On the other hand, the tax is subtracted, as it must be paid in cash. This indicator is important because it allows comparing the cash inflows and outflows resulting from the entity's activity. When the indicator is negative, the bank's situation is concerning.

In the relationship between the bank and the shareholders, they can strengthen their investments by increasing the share capital, selling their shares to the company by checking a capital reduction or receiving dividends from the bank. Cash flow for shareholders can be calculated as follows:

$$Cash\ Flow\ for\ Shareholders = Dividends\ paid - Net\ issue\ of\ shares \quad (25)$$

In relation to lenders, in their relationship with the financial institution, they can strengthen investment by increasing the bank's capital. However, they can recover the bank's credits through a reduction in the borrowed capital or receive interest, and these situations correspond to cash outflows. The cash flow for lenders can be written as follows:

$$Cash\ Flow\ to\ Lenders = Interest\ paid - Net\ Loans \quad (26)$$

According to Monteiro (2012), a bank with a high cash flow is an entity in a favorable situation, as it fulfills the bank's objective of generating value. Cash flow models are very important for financial institutions with market capitalization, such as Banco Invest, because there is an alternative growth associated with capital gains obtained by investors or the risk of the bank not corresponding in terms of growth and being eliminated due to market pressure. According to Monteiro (2012), in these evaluation models, it is important to consider an appropriate discount rate.

The updated cash flow model appears as one of the most frequent financing methods, as it makes no sense to establish the bank's value in historical terms, since it has the potential to generate wealth. Under these models, equity cash flow and free cash flow are often used and, in specific cases, the model for adjusted present value and compressed adjusted value is used.

2.5.1. Capital Asset Pricing Model (CAPM)

As we studied in Viebig et al. (2008), the Capital Asset Pricing Model explains how assets are priced in equilibrium. This model states that there are no transactions costs, all assets are traded and there is no private information in the market. Therefore, in CAPM model the risk of an asset corresponds to the risk that this asset represents in the market portfolio (Damodaran, 2015). This model states that investors are risk averse and it is only based on quantifying systematic risk since it assumes investors will be cautious and will have well-diversified portfolios in order to eliminate unsystematic risks (Hitchner, 2011). The main characteristic of this model is that investors evaluate the risk of an asset in terms of its contribution to their systematic risk of the portfolio Pinto.

CAPM suggests that an investor only invests in riskier assets if he is expecting to receive a premium higher than the risk-free rate to compensate the risk he is assuming.

There are some crucial assumptions of this model (Viebig et al., 2008):

(I) All investors follow Markowitz's approach: markets are perfect, taxes and transactions costs are meaningful, they prefer low risk (i.e. low variance) and high expected returns and investors will only prefer efficient portfolios with minimum levels of risk.

(II) Risk-free asset is available: there is a risk-free asset available in the market.

(III) Homogeneous expectations: all investors have homogeneous expectations since they can invest and borrow in the market at the same known risk-free rate in the same period. The capital market line is the same for all investors.

$$E(R_i) = R_f + \beta i\ (Market\ Risk\ Premium) \tag{27}$$

$$Market\ Risk\ Premium = E(R_M) - R_f \tag{28}$$

Where,

E(Ri) – expected return of the asset in equilibrium

Rf – risk-free rate

βi – asset sensitivity to the market

$E(R_M)$ – expected return on the market portfolio

$E(R_M)$ - Rf – expected return on the market portfolio over risk free bonds

The Market Risk Premium is the expected return on the market portfolio minus the risk-free rate and therefore it represents the premium demanded by investors to invest in the market portfolio over riskless assets (Pinto et al., 2010).

The formula presented above is divided in two parts: (i) the risk-free rate that accounts for the value of the investment in time, (ii) inherent risk exposure through a risk premium. Beta gives the equation the degrees of risk investors are facing.

Considering that Portugal is facing a crisis periods, it is important to add an additional country risk premium to the model since investors may demand an extra premium related to the country's asset, and so that the extra risks are also reflected in the CAPM Model:

$$E(R_i) = R_f + \beta i\left[E(R_M) - R_f\right] + CRP \tag{29}$$

Where,

CRP – Country Risk Premium

Although there are some approaches to compute the Country Risk Premium, I will not perform a deeper analysis on its estimation, since we can have the CRP through investor's surveys, as Damodaran does.

2.5.2. Cost of Equity (K*e*)

The cost of equity, K*e*, reflects the expected rate of return for equity investors to claim to invest in the firm's equity (Damodaran, 2015). Specifically, for a financial firm, the cost of equity must reflect the portion of the risk that cannot be diversified (Damodaran, 2009b).

$$K_e = E(R_i) = R_f + \beta i \left[E(R_M) - R_f\right] + CRP \tag{30}$$

Where,

K*e* – cost of equity

2.5.3. Risk Free Rate (R*f*)

The risk free asset is the rate of return with no risk involved. Following Damodaran (2006) it can be estimated by comparing either the expected return to short-term government securities, using treasury bills, or long-term government securities, specifically ten-year zero coupon bonds.

There are two basic conditions that must be met:

(I) There can be no default risk, just like government securities;

(II) There can be no reinvestment risk so that it can be full field the condition of the actual return being equal to its expected return.

Therefore, an investment can only be risk free if it is issued by an entity with no default risk and the specific instrument used will vary depending upon the period for which we want the return to be guaranteed.

To conclude with, Damodaran (2008) defends that using the 10 year bond rate as the Risk-free rate is a good practice in valuing financial firms.

2.5.4. Beta (β*i*)

The βi measures the sensitivity of the returns on an asset to movements of the returns on the market portfolio (Viebig et al., 2008).

This coefficient equals the covariance between the return of asset and the returns on the market portfolio divided by the variance of the returns on the market portfolio.

$$\beta i_M = \frac{cov(R_i, R_M)}{\sigma^2(R_M)} \tag{31}$$

Where,

R*i* – return on an asset

R_M – return on the market portfolio

Beta can be estimated by three approaches (Damodaran, 2015):

(I) Historical Market Betas: estimating betas by making a regression with historical data of the returns of a specific asset against an equity market index or multiple macroeconomic factors.

(II) Fundamental Betas: this approach is less reliant on historical betas and more turned to the fundamental decisions the firm made on what business to be in and how much operating and financial leverage to use.

(III) Accounting betas: estimate the beta of a firm from accounting earnings instead of traded prices.

Consistent with Damodaran (2009b), there are three notes to keep in mind when estimating betas to financial service firms:

(a) Use bottom-up betas: financial firms can change over the period of the regression due to changes in regulatory constraints, such as Basel.

(b) Do not adjust for financial leverage: in financial firms the capital structure tends to be homogeneous due to regulatory capital constrains and it is very difficult to measure the financial institutions' debt.

(c) Adjust for regulatory and business risk: by using sector betas and not adjusting for a group of financial firms we are considering the same beta for every bank in the sector.

2.6. VALUING A BANK

2.6.1. Comparing Valuation Methods

To choose the best way to value a financial institution we must consider accuracy and applicability criteria. We consider accuracy an important criterion because it aims to measure the exactitude of a model in determining the fair value of a bank. The bigger the difference between the market price and the target price (computed by applying the model), the fewer the accuracy of the model.

With the criteria of applicability, we aim to evaluate the easiness of using a certain model considering the information available in the market. Thus, a valuation can have a certain level of applicability considering some factors such as the number and complexity of the variables used to estimate the model and the information available in the market.

Damodaran (2012) recommends that Discounted Cash Flow methods are easier to apply for firms whose cash flows are currently positive and can be forecasted with some reliability for future periods. These methods face some difficulties when trying to apply to (i) firms in trouble; (ii) cyclical firms, since they follow the economy trend by rising during booms and falling during recessions; (iii) firms with unutilized assets since they do not produce any cash flow, making the model incongruous; (iv) firms with patents or product options and (v) firms in the process of restructuring firms.

Therefore, and as mentioned before, valuation with discounted cash flows is simpler to perform in well-defined assets that generate cash flows and can be easily forecasted, such as banks and financial institutions.

On the other hand, we also have relative valuation methods, such as multiples. This approach is very simple and can be used to estimate a value of a firm quickly and is very useful in large number of comparable firms. However, multiples are too easy to misuse and manipulate, especially when comparable firms are used. Given the fact that two firms are never exactly alike in terms of growth and risk, this approach becomes very subjective. Additionally, this method can be biased by the analyst performing the valuation by choosing a group of comparable firms to confirm the biases about the bank's value. Although Discounted Cash Flows methods can also be biases, it is a much more explicit model about the assumptions used to determine the final value. In relative valuation the assumptions are often left unstated.

At last, in contingent claim valuation equity can be viewed as a call option on the value of the underlying firm, with debt representing the strike price and the term of debt used to measure the life of the option. These models present limitation in long-term options and non-traded assets. Also, when the underlying asset is not trade, the inputs of the underlying asset cannot be seen in financial markets and must be estimated. Therefore, this model as much more estimation error associated than DCF valuation methods.

According to Damodaran (2009b), the best way to value a financial service institutions is through equity valuation models. On the other hand, Deev (2011) defends that ultimately all valuation methods are applicable to banks under certain circumstances. Also for Deev (2011) the Discounted Cash Flow methods give us the best theoretical results, more specifically the Free Cash Flow to Equity and the Dividend Discount Model.

Therefore, this equity research is going to be centered over those the equity valuation method Free Cash Flow to Equity (FCFE).

Valuation Approach	Advantages	Disadvantages
Discounted Cash Flows	- Flexible for changes - Considers future expectations - Considers market performance (through excess return on market)	- Controversial results (requires projections of future economic benefits) - Requires estimates of appropriate discount rates (also subject to controversy) - Partially based on probabilities and expertise - Problems with application in the emerging markets (due to the lack of market information) - The valuation results can be easily manipulated
Relative Valuation	- Uses actual data - Simple application (derives estimates of value from relatively simple financial ratios) - Does not rely on explicit forecasts - Considers market reaction on bank performance - Reflects the M&A practice	- Most of the important assumptions are hidden (bank's expected growth in earnings, risk and margins) - No good guideline companies exist (therefore, expertise and additional adjustments are required) - Laborious and time-consuming (an immense amount of data has to be processed) - Based on the present situation, resulting in losing long-term trends
Liquidation and Accounting Valuation	- Simple for understanding and practical usage - Does not require guesswork and assumptions	- The most simplified valuation model - Requires access to all of the bank's internal data - Does not consider the long-term development perspectives
Contingent Claim Valuation	- Captures The specific characteristics of banking better than any other approach	- Regulatory factors are not included - Possible problems with application (requires the building of a mathematical model)

Table III - Comparing Valuation Approaches

Source: (Deev, 2011)

2.6.2. Main Risks of Banco Invest

The main risk associated to Banco Invest refers to the volatility of prices in global terms and, consequently, to the volatility of interest rates charged to obtain the same interest return.

The regulatory risk is high since the nature of the banking sector requires that several aspects be regulated. On the other hand, the Bank faces a certain level of debt risk, since in order to meet the financial needs of its customers, it is necessary to use capital, which must be from debt capital whenever its cost is less than the cost of equity. Due to this indebtedness risk, several financial risks arise, such as liquidity risk and the risk associated with the market, again associated with the volatility of interest rates. Thus, Banks intend to reduce the risk associated with the volatility of prices and of interest rates. Therefore, they resort to the use of financial derivatives, not through speculation, but to cover the risks mentioned. To finance the investments made, the bank mainly carries out medium and the long-term external loans and financing, with occasional short-term financial transactions being carried out.

Exchange rate risk should also be mentioned in Banco Invest analysis, given the internationalization of services provided and the globalization of all financial entities. In addition, there are political and fiscal risks as well, as situations of financial crisis affect all variables at Banco Invest.

3. SECTOR ANALYSIS

3.1. GLOBAL BANKING INDUSTRY

The global banking industry performance was marked by the financial crisis triggered in 2007, affecting mainly European and North American banks, leading to a loss of credibility on the banking sector. This debasement of bans leads investors to follow capital retention policies and to avoid new capital investments, causing instability around the world.

During the year of 2019, and according to the International Monetary Fund (IMF) the world economy recorded the lowest growth rate in the last decade since the 2007-2008 global financial crisis with a world GDP growth rate of 3% (previously 3,6% in 2018), as a result of disturbances in international trade, the intensification of geopolitical tensions and the loss of strength in important emerging markets.

Taken as a whole, emerging economies saw their GDP growth drop from 4.5% to 3.7% in 2019, while advanced economies decelerated from 2.2% to 1.7%.

Financial markets have seen a reversal of the trend towards normalization of global monetary policy dictated by weakening economic growth, affecting mainly advanced economies such as the United States and the euro area. The slowdown in activity was even more pronounced in emerging markets and developing economies, including Brazil, China, India, Mexico, and Russia, and in some economies in specific financial and social difficulties, such as Argentina.

This downturn of the global economy was mainly due to the increase in trade barriers and the uncertainty generated by it. In this context of a slowdown in the economy, the main central banks increased their more expansionary monetary policies.

For instance, the Federal Reserve reduced the USA reference interest rate from 2,50% to 1,75% and reintroduced the debt securities purchase program. Like the USA, the European Central Bank (ECB) lowered the deposit rate to even more negative values (from -0,40% to -0,50%) and returned its asset purchase program (euro 20 thousand million per month since November). In this context, and even with a recovery at the end of the year, the 3-month Euribor fell from -0.309% to 0.383% in 2019, while the 10-year Bund's yield decreased from 0.242% to -0.185% (with a minimum of 0.714% at the end of August). The 10-year Treasury yield dropped from 2.685% to 1.919% (minimum of 1.457% at the beginning of September).

Weak external demand, commercial tensions and political uncertainty (such as Brexit and some social protest movements such as in Hong Kong, France, Catalonia and Latin America) continued to weigh on investment and industrial activity in the European Zone. Thus, there was a postponement of investment decisions in the main economic areas and a negative trend in international trade flows.

The US-China “trade war” and expectations of normalization of monetary policy that marked the first half of the year contributed to a one-time reversal of the US yield curve, fueling some fears of recession. Among the main emerging economies, the slowdown in China and India stands out. In the first country, according to the IMF, the economy grew by 6.1% in 2019 (6.6% in 2018), the lowest value since 1992, penalized by trade tensions with the United States, decreased global demand and

increased indebtedness of local governments. In India, the economy grew by only 4.8% in 2019, thus registering a significant slowdown compared to the previous year and below expectations. In the USA, GDP grew 2.3% in 2019, 0.6 percentage points less than in the previous year. The current US economic expansion is slowing down due to trade tensions with China and the increase in tariffs on imports of various products, and the decrease in industrial activity.

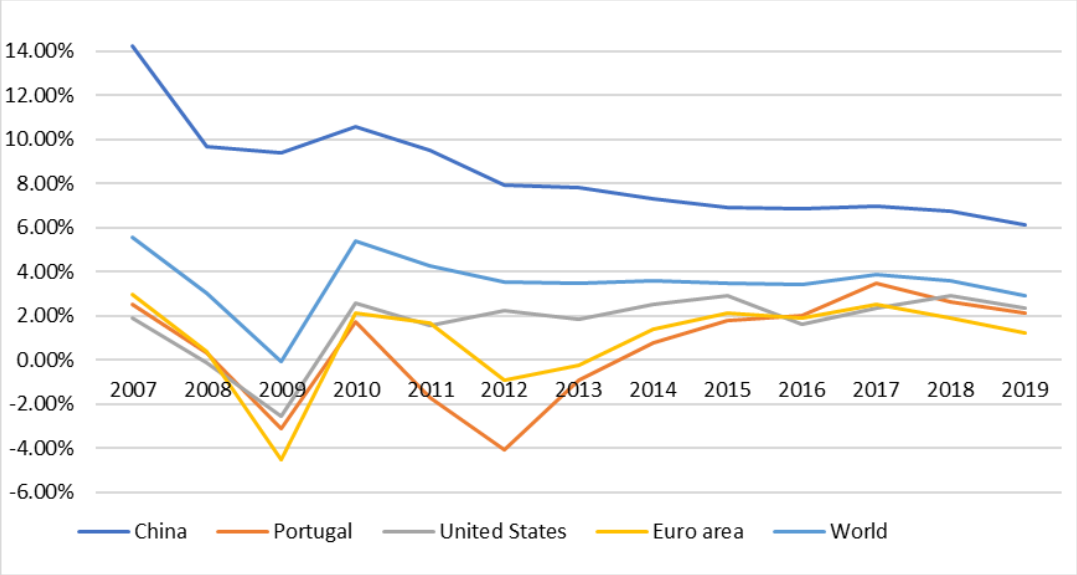


Figure I – Real GDP growth rate

Source: International Monetary Fund, World Economic Outlook Database, April 2020

In USA, the unemployment rate ended the year at 3.5% at the minimum since 1969 and well below the average of 5.7% since 1948.

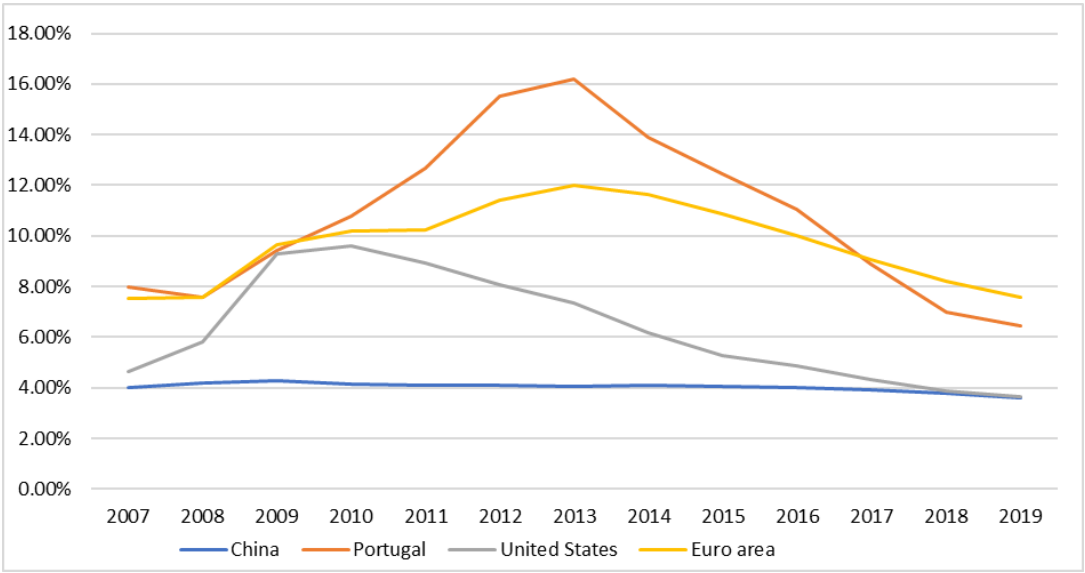


Figure II - Unemployment Rate Evolution

Source: International Monetary Fund, World Economic Outlook Database, April 2020

Reflecting the good moment in the USA labor market, including a 5.2% increase in wages in annual terms, the inflation rate registered a slight increase during the last quarter, ending the year at 2.3%.

In the Euro Zone, this indicator rose from 1.1% to 1.3% in the same period, still far from the target. In China, inflation rose from 1.7% to 4.5%, reflecting the effects of African swine fever on food prices.

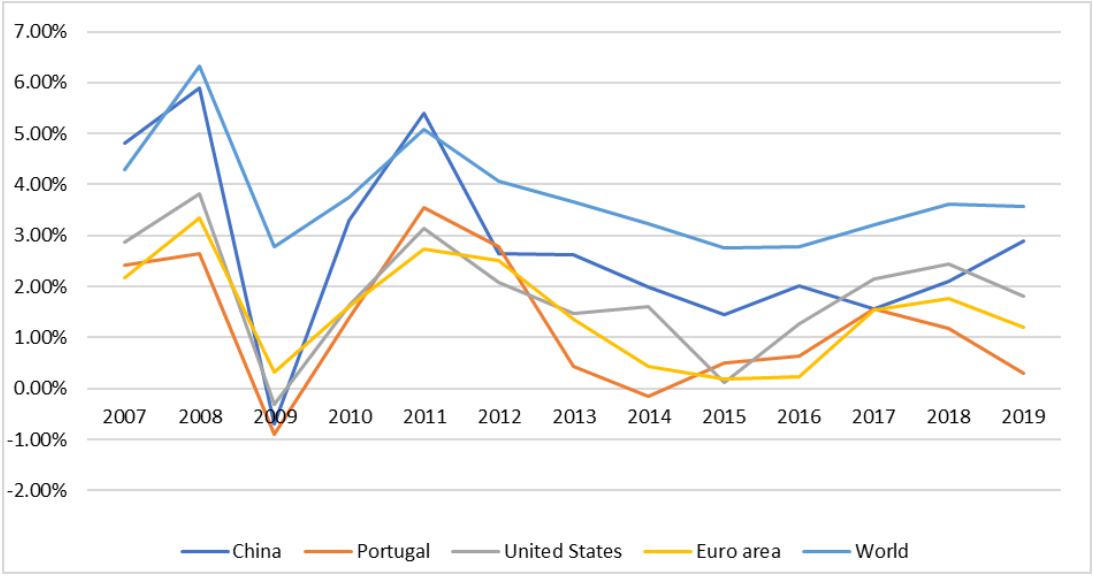


Figure III - Inflation rate evolution

Source: International Monetary Fund, World Economic Outlook Database, April 2020

However, the world has changed dramatically since January 2020 on the global economy.

The International Monetary Fund estimates the extent of the impact of the pandemic of the new coronavirus on a contraction of the world economy of 3.0% in 2020 , followed by a partial recovery based on an expansion of the Gross Domestic Product (GDP) of 5.8% in the following year.

IMF also said that this will be the first time in nearly a century that advanced economies and emerging markets will be simultaneously in recession since this crisis is like no other. First, the shock is large. The output loss associated with this health emergency and related containment measures likely dwarfs the losses that triggered the global financial crisis. Second, like in a war or a political crisis, there is continued severe uncertainty about the duration and intensity of the shock. Third, under current circumstances there is a very different role for economic policy. In normal crises, policymakers try to encourage economic activity by stimulating aggregate demand as quickly as possible.

3.2. PORTUGAL

The international crisis triggered in 2007/2008 lead to a loss of credibility in financial institutions and the system all over Europe and internationally. This marked the start of a downward which led Portugal to an unsustainable situation in economic and financial terms. On that time, banks were trying to reduce its exposure to European Central Bank but given the extremely adverse macroeconomic and financial environment, there came the need to more strict rules and regulation with the aim of

strengthening capital ratios and liquidity buffers to ensure the likely need for state support reduces. The dependence on European funds became real to Portugal on May 6th 2011 when the country was obligated to ask for aid of 78 billion euros, entering in an agreement with the European Commission, the Central Bank and the International Monetary Fund (Troika Memorandum) in order to get over the crisis that we were living. The Portuguese banking sector is composed by 49 banks. The history of the Portuguese banking sector was marked by the collapse of its largest private banking entity, Banco Espírito Santo (BES) in August 2014. In December 2015, Banco Internacional do Funchal (Banif) also required a bail-out of 2.26 billion euros having their assets been sold by 150 million euros to the Spanish bank Banco Santander Totta. More recently, in 2016, Portuguese authorities disclosed the recapitalization plan for the state-owned bank, Caixa Geral de Depósitos by the amount of 1.65billion euros.

After three years of recession, the Portuguese economy returned to growth in 2014 (+0,9%), having continued the gradual recovery process in the next few years, growing 1,8% in 2015 and 2,0% in 2016 and accelerated strongly in 2017, to 3,5% (the highest growth rate since 2000: 3,8%), but having decelerated in 2018, with GDP growing by 2,6% (revised from +2,4%), and again in 2019, for a growth of 2,2%, contrary to expectations that pointed to more moderate levels of expansion, taking into account the slowdown in global activity.

In fact, a slowdown in exports of goods and services was observed throughout the year, which, however, was offset by the dynamism of private consumption, in a context of improved labor market, and by the acceleration of fixed investment, which counted with the strong impulse of the construction sector, in a context of great vigor of the national real estate market.

Private consumption maintained a relatively stable real growth compared to 2018 (2.3%), while investment registered a slight acceleration (for an annual variation of 7.2%).

Net external demand, on the other hand, made a moderately negative contribution to GDP growth, with exports decelerating more than imports. Sales of goods and services abroad grew 3% in real terms, with imports registering an annual variation of 5.3%.

The yield on 10-year government bonds fell from 1.72% to 0.44% (with a minimum of 0.071% in mid-August), with the spread vis-à-vis the Bund narrowed from 148 to 63bp. The PSI-20 index appreciated 10.2%.

The improvement in the economic situation, together with the reduction in the financing costs of the Portuguese Republic, contributed to the strengthening of the process of consolidating public finances.

In 2019, the government balance was 0.2% and the public debt ratio, which in 2014 reached a historical high of 132.9% of GDP, decreased in 2019 to 117.7% of GDP.

In 2020, the European Commission (EC) foresees a slight deceleration of Portuguese GDP with an estimate of a strong negative impact of the coronavirus pandemic on activities more related to tourism, in a context of stabilization of domestic demand, after high levels of growth observed in recent years, and strong uncertainty regarding the evolution of the world economy.

In the labor market, the unemployment rate decreased from 7.0% in 2018 to 6.5% in 2019, continuing the downward trend since the peak reached in early 2013 (17.5%), but in 2020 unemployment is expected to increase significantly.

Inflation, as measured by the average annual variation of the consumer price index (CPI), was 0.3% in 2019, 0.7 pp less than the figure for 2018 (+ 1.0%, after +1.4 % in 2017), thus benefiting the purchasing power and generating favorable monetary and financial conditions for the growth of housing and consumer credit.

Subject (%)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
GDP	2,507	0,319	-3,122	1,738	-1,696	-4,057	-0,923	0,792	1,792	2,019	3,506	2,637	2,157
Inflation	2,422	2,652	-0,903	1,391	3,554	2,776	0,440	-0,160	0,508	0,636	1,556	1,168	0,300
Unemployment	7,964	7,552	9,432	10,770	12,677	15,526	16,183	13,894	12,444	11,066	8,867	6,994	6,463

Table IV - Portugal GDP, Inflation and Unemployment Rate

Source: International Monetary Fund, World Economic Outlook Database, April 2020

The Portuguese banking sector has been showing significant increases in terms of efficiency, liquidity, asset quality, profitability and solvency.

On the asset side of the banking sector in Portugal, the main evolution was felt in loans to customers. It is also important to note that, following this increase in loans, there was a reduction in NPL since the maximum reached in June 2016, decreasing around 27 billion euros.

On the liabilities side, there has been an increase in deposits as the main source of financing for the sector despite the current context of low interest rates. There was also a significant decrease in the sources of market financing. The weight of deposits in the financing structure of Portuguese banks is higher than the average for the Euro Area and most other Member States.

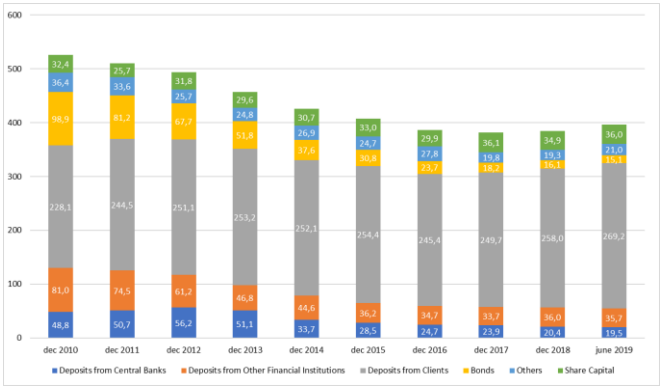


Figure V - Funding Structure (billion EUR)

Source: Bank of Portugal

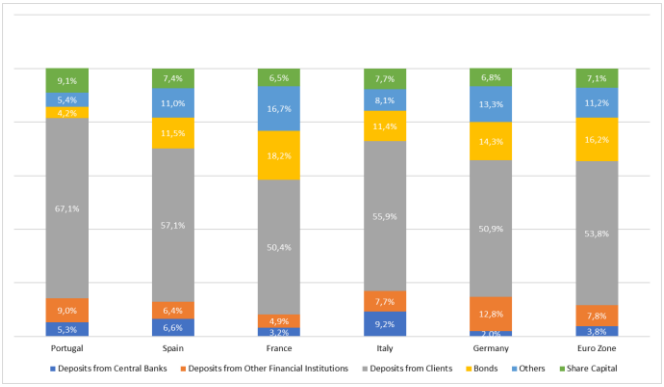


Figure IV - Portugal vs Euro Zone

Source: Bank of Portugal

Deposits demonstrated a high level of resilience, which reflects depositors' confidence in the national banking system. Private deposits reached their highest value in June 2019, standing at 148 3 billion euros.

In a context of very low interest rates, because of the ECB's accommodative monetary policy, there has been a decrease in the weight of time deposits and an increase in the weight of overnight deposits.

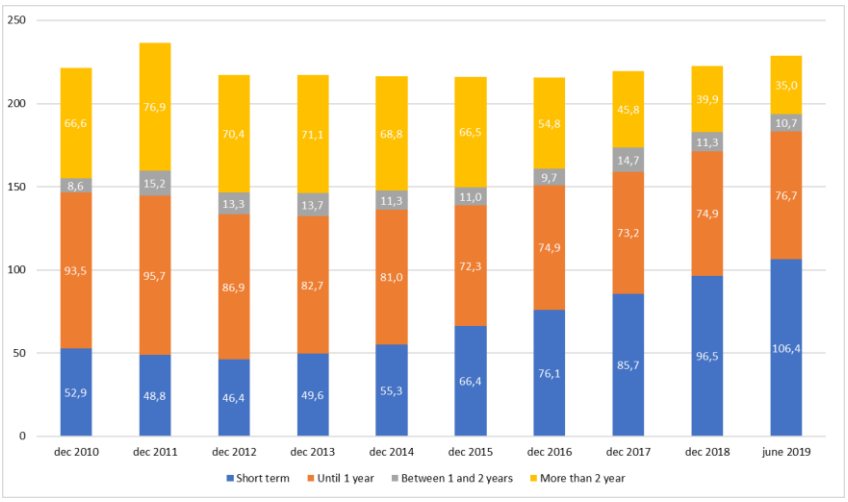


Figure VI - Evolution of Term Deposits (billion EUR)

Source: Bank of Portugal

The financing obtained from the ECB has been decreasing steadily since the historical maximum registered in June 2012 in this period, the weight of this source of financing in total assets has decreased significantly, from 10.5% to 4.7%.

The system's liquidity situation is at extremely comfortable levels, the funding gap has been narrowing, the transformation ratio has been on a downward trend and the liquidity coverage ratio has been increasing. Solvency has been improving, reflecting the strengthening of own funds by several financial institutions, the favorable evolution of risk-weighted assets and improved profitability. The leverage ratio is considerably higher than the Euro Area average and the minimum reference (3%).

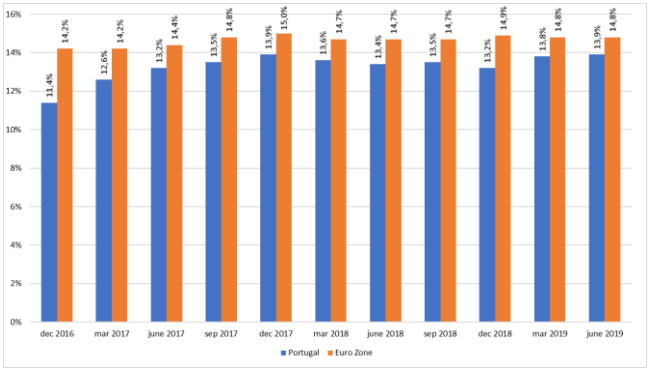


Figure VII - Common Equity Tier 1 ratio (CET1)

Source: European Central Bank

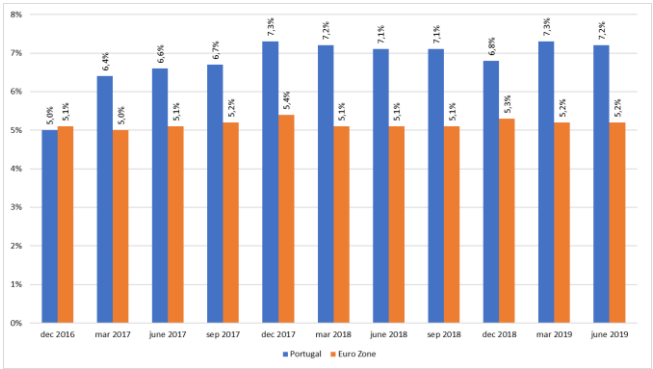


Figure VIII - Leverage Ratio

Source: European Banking Authority

In terms of profitability, the trajectory has been one of recovery. However, compared to most countries in the Euro Area, the profitability of the Portuguese banking system still remains at low levels and below the cost of capital.

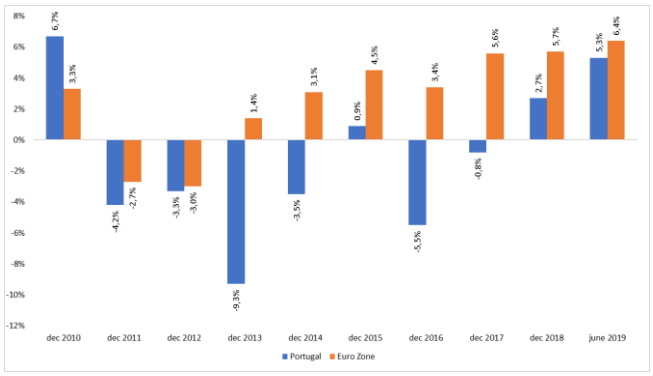


Figure X - Return on Equity evolution (ROE)

Source: European Central Bank

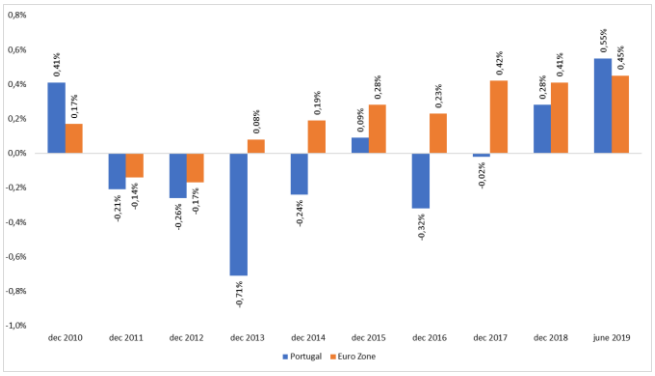


Figure IX - Return on Assets evolution (ROA)

Source: European Central Bank

The evolution of the banking product has reflected the volatility of some components (performance of the financial markets and execution of the NPL sales plans) In the first half of 2019, the banking product registered, in year-on-year terms, a slight increase (+ 3%).

Therefore, we can conclude that the Portuguese banking sector is more resilient compared to the pre-crisis period, showing considerable progress in terms of efficiency, liquidity, asset quality, profitability and solvency (Associação Portuguesa de Bancos, 2019).

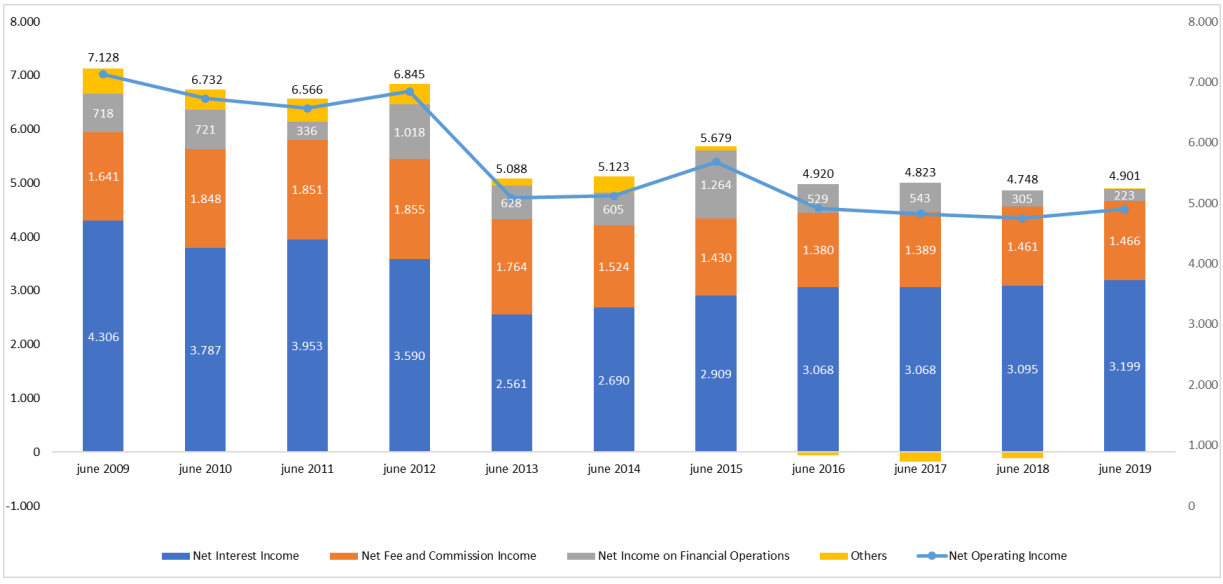


Figure XI - Breakdown of Net Operating Income (million EUR)

Source: Bank of Portugal

3.3. REGULATORY FRAMEWORK

The critical role of the mortgage market in triggering the recent global financial crisis has increased policy interest, bank regulation and academic research in this default and market risk area. The banking regulatory framework changes brought by the revised Basel Committee on Banking Supervision (BCBS) Accords (later adopted by national legislation in many countries and regions, for instance, the European Capital Requirement Directives and the US Regulatory Capital Rules) introduced stronger risk management requirements for banks, with capital requirements tightly coupled to estimated credit portfolio losses. The recently adopted IFRS9 and FASB's Current Expected Credit Loss (CECL) standards introduce revised expected credit loss or impairment calculation rules requiring financial institutions to calculate expected loss for the banking book over the entire life of the exposures. Encouraged by regulators, banks devoted significant resources to develop an Internal Ratings Based approach (IRB) for the calculation of risk weighted assets for market and credit risks to better support decisions when granting loans, to quantify expected credit losses and to assign the mandatory economic capital (Chamboko & Bravo, 2020).

As mentioned before, the Global Economic Crisis led to the breakdown of consumer confidence in financial institutions. Banks and financial institutions were mainly dependent on short term funding and with this, it was clear that banking regulatory systems had to intervene and address the problems the economic world was facing. In the wake of the Lehman Brothers collapse of 2008 and to ensure the resilience of the financial institutions, the Basel Committee on Banking Supervision decided to strengthen the previous Accords. In November 2010, a new agreement was issued regarding the overall design of the capital and liquidity reform package, known as Basel III and that would be gradually implemented until the beginning of 2019. This agreement has the purpose to strengthen the requirements established by Basel I and II with especial emphasis in improving the banking sector through the bank's risk management and governance, to reinforce the bank's transparency and to ensure that financial institutions have enough capital to face unforeseen losses.

This Basel III Accord requires banks to have a minimum amount of common equity and a minimum liquidity ratio in order to mitigate risk within the international banking sector, by requiring banks to maintain proper leverage ratios and keep certain levels of reserve capital on hand. Tier 1 shows us the bank's core capital and his reserves providing a cushion that allows it to weather stress and maintain a continuity of operations. The higher the ratio of Tier 1, the higher the adequacy a bank must support its activity. By contrast, Tier 2 refers to a bank's supplementary capital such as undisclosed reserves and subordinated debt instruments. The bank's total equity is calculated by adding both Tier 1 and 2 together. Under Basel III, the minimum total capital ratio is 12.9%, whereby the minimum Tier 1 capital ratio is 10.5% of its total risk-weighted assets (RWA), while the minimum Tier 2 capital ratio is 2% of the RWA. The capital-to-risk-weighted-assets ratio promotes financial stability and efficiency in economic systems throughout the world.

Meanwhile, the Portuguese Government, International Monetary Fund and the European Union, known as Troika, signed a surveillance program in order to restore customers trust in the Portuguese banking system. With these reforms the world expected to bring together micro and macro-economic benefits for the crisis period we were living. Additionally, and in accordance with Aviso do Banco de Portugal nº 3/2011, it "*was established the necessity of reinforcing the resilience of the Portuguese*

banking system to unpredictable shocks and to go along with the levels that are being demanded on an international landscape".

Although there are benefits coming out from Basel III Accord, there are also some risks associated with it. To be more specific, most banks will try to fulfill the requirements ahead of the timeframe planned, which will increase competition consequently increase pressure on peers.

4. BANCO INVEST S.A.

4.1. COMPANY PRESENTATION

Banco Invest is a public limited company, with its registered office in Lisbon, founded on February 14, 1997 under the name of Banco Alves Ribeiro SA, having started its activity on March 11, 2007. The bank's constitution was authorized by the Bank de Portugal on December 4, 1996. on September 16, 2005, the bank changed its corporate name to the current one.

On December 22, 2004, the deed of merger, by incorporation into the Bank, of Probolsa - Sociedade Corretora, SA was carried out. As a result of this process, the merged company was extinguished, and all its rights and obligations were transferred to the Bank. The merger produced accounting effects as of January 1, 2004, with Probolsa's assets and liabilities being transferred to the Bank based on the respective net balance sheet value on that date.

The Bank's corporate purpose is to carry out operations and provide financial services related to the latitude permitted by law. is mainly dedicated to asset management, capital markets, credit and development capital.

Banco Invest specializes in managing savings and investments of its private, corporate and institutional clients, offering an open and independent structure, with a global and diversified set of products and services. Therefore, one of the goals of this thesis is to better understand how private and investment banking has been playing in the financial institution’s markets through the years.

The Bank currently has six major business areas: Asset Management, Brokerage, Specialized Credit, Institutional Custody, Corporate Finance and Treasury and Capital Markets (*Annual Report Banco Invest 2019*).

The Asset Management area includes the management of own investment funds, the distribution of investment funds managed by third parties, discretionary portfolio management, investment advice and the issuance of structured products.

The Brokerage area includes brokerage and intermediation of shares, bonds, exchange traded funds, warrants and futures contracts. Banco Invest is present in the Prime Brokerage and Online Brokerage segments.

The Specialized Credit area is divided into four types of offer: margin account, mortgage credit, popular economic credit and BI Credit.

The Institutional Custody area is aimed at independent management companies of securities and real estate funds. in addition to custody, the services offered include financial intermediation, products for hedging and risk management and asset management for institutional clients.

The Corporate Finance area, operating under the Invest Corporate Finance brand, is composed of a team with over 25 years of experience in domestic and cross-border transactions. The services available include Corporate Finance Advisory and Capital Markets Advisory. Banco Invest is an exclusive member for Portugal of IMAP, an international advisory network on mergers and acquisitions

present in 40 countries. In 2019, the operations performed by the IMAP network amounted to approximately USD 13 billion.

The Treasury and Capital Markets area focuses its activity on managing the balance sheet liquidity, optimizing the use of funding and managing the portfolio of shares and bonds of Banco Invest.

Liquidity management seeks to optimize the balance sheet structure in order to keep the maturity structure between assets and liabilities under control, considering the Bank's foreseeable growth. Management is also conditioned by the need to maintain a level of liquidity reserves enough to maintain prudent levels of liquidity coverage. Liquidity risk is managed in order to monitor the growth of the Bank's assets and ensure the fulfillment of treasury needs without incurring abnormal losses, maintaining in the portfolio of tradable assets that constitute an enough liquidity reserve.

The management of the Bank's Treasury and Own Portfolio is the responsibility of the Financial Department, in accordance with the policies defined by the Bank's Investment Committee (CIB). The CIB, made up of officials from the different areas involved, defines the global guidelines on the Bank's positioning, and then the Financial Department, within the defined risk limits, manages the Bank's exposure to each of the market risks.

Figure XII - Bank's Organizations

Source: Annual Report - 2019

In 2003, there was the securitization of 100 million euros of Bank Credit Portfolio contracts: (i) first securitization of real estate leasing contracts in Portugal; (ii) first intervention by the European Investment Fund in an issue originated by a Portuguese bank; (iii) the first securitization of credit agreements in Europe with guarantee from the European Investment Fund included in the structuring of the bonds issued. In the same year, there was the launch of derivatives brokerage services.

In 2010, despite the negative economic environment, Banco Invest ended the year with a net profit of around 7 million euros and a solvency ratio of 13.3 that clearly shows its solidity and security.

In 2012 and 2014, Euromoney magazine awards Banco Invest with the Best Distributor for Performance award, which distinguishes the products issued by the Bank as the most profitable for the end customer.

In 2015, the financial publication International Banker awarded Banco Invest with the "Best Investment Bank Portugal 2015" award and Global Banking & Finance also awarded Banco Invest as the "Fastest Growing Private Banking Portugal 2015".

In 2016, the Invest BTrader platform was launched. An innovative and multi-award-winning trading platform that allows clients to directly access the CFD's, Equities, Forex, ETF's, Futures and Options markets.

For the 5th consecutive time, International Banker named Banco Invest as "Best Investment Bank Portugal 2019". The prize, awarded at the International Banker Banking Awards 2017, honors high-level organizations, setting new standards of performance and different limits within the financial sector.

During the year of 2019, Automobile Credit became part of the Bank's offer, financing up to 100% of new or used vehicles, with no age limit.

4.2. SHAREHOLDERS STRUCTURE

According to Banco Invest's 2019 Annual Report, the bank issued 2.400.000 preferred shares in 2008 with the nominal value of 5 euros, fully subscribed and paid up by the shareholder Alves Ribeiro – Investimentos Financeiros, SGPS, S.A..

Therefore, as of December 31st, 2019, the bank's majority shareholder has 11.861.500 shares of 11.900.000 shares with a par value of 5,00€. As the majority shareholder, Alves Ribeiro – IF, SGPS, S.A. has in hands 99,68% of the share capital.

Shareholder's Structure		
Entity/Name	Number of Shares	%
Alves Ribeiro - IF, SGPS, S.A. (Ordinary Shares)	9.461.500	79,51%
Alves Ribeiro - IF, SGPS, S.A. (Preferred Shares)	2.400.000	20,17%
Others	38.500	0,32%

Table V - Banco Invest S.A.'s shareholders structure

Source: Annual Report - 2019

4.3. FINANCIAL INDICATORS

The analysis of the bank's financial data allows to identify positive and negative aspects within the bank. This analysis is relevant for the evaluation of the Bank's performance, but also for the analysis of the competitive market in which Banco Invest operates. Thus, when identifying the most concerning financial components of the bank, it becomes possible to adopt measures that improve its performance. Therefore, we will present and study some of the most important financial indicators in order to conclude about the Banco Invest's performance in the Portuguese market.

Return on Equity (ROE) is a measure of how effectively management is using a Bank's assets to create profits. It is calculated by dividing net income by shareholders' equity. In general, investors consider a ROE less than 10% as poor. On the other hand, Return on Assets (ROA) is an indicator of how profitable a Bank is relative to its total assets. Through ROA we can understand how efficient a Bank's management is at using its assets to generate earnings. It is calculated by dividing a Bank's net income by total assets and the higher the value the more asset efficiency a Bank shows because it is earning more money on less investment.

As we can see in the figure below, ROE and ROA present very volatile values since 2014 due to high levels of volatility of net income in Banco Invest. ROE has been changing a lot through the years, from a percentage of 22,72% (2014) to 9,51% (2019). On the other side, ROA shows us values around 1,71%, starting with 2,69% in 2014 and presenting a value of 1,39% in 2019. Therefore, we can conclude that Banco Invest maintained a profitability above the sector average, with ROE totaling 9,51% and ROA 1,39% mainly because of the banking product increasing of 17.6% to 39 million euros.

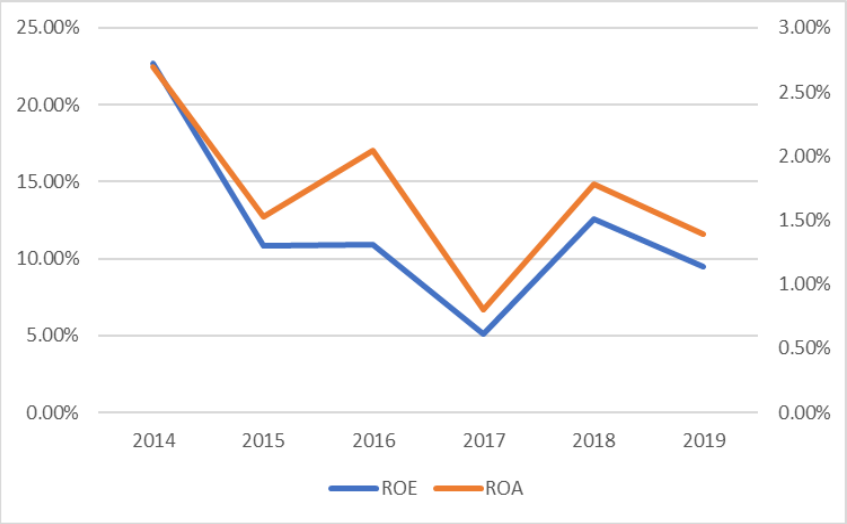


Figure XIII - ROE and ROA evolution

Source: Annual Reports – 2014 to 2019

Figure XIV simultaneously represents Banco Invest's operating income in the 2018 and 2019 period and its net income in that period. Thus, revenues increased significantly, given the bank's strategy. Even so, despite the increase in revenue, net income was reduced in the analyzed period. This situation highlights the cost increase associated with the increase in revenue, reason why possibly the margin tends to be lower, as analyzed later.

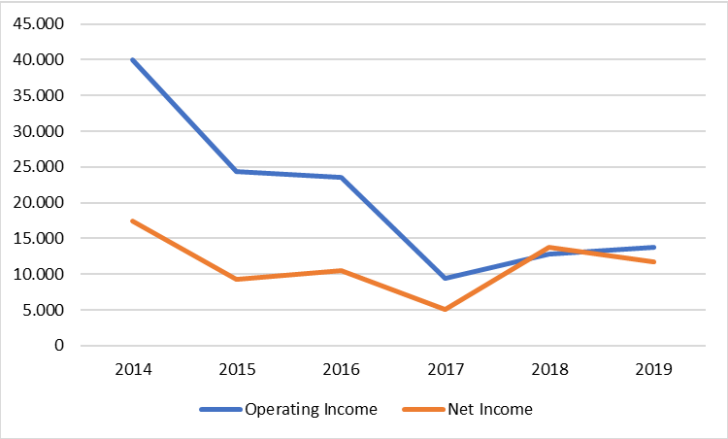


Figure XIV - Operating Income and Net Income evolution (in thousands)

Source: Annual Reports – 2014 to 2019

Net Interest Income has been increasing in the last few years since 2015. The main reasons for this raise through the years are (i) grew of 9,6% in 2016 comparing to 2015 due to the optimization of asset and liability management, meaning, the Bank managed to increase the margin, despite a reduction in the banking portfolio - credit and credit securities - and an increase in customer resources. Indeed, funds raised through customer accounts grew by 2,8%, but the Bank managed to reduce the cost of these deposits by 35,5%; (ii) grew of 28,9% in 2017 reflecting the beginning of the BI Credit brand operation and the consequent increase in the loan portfolio; (iii) grew of 4 million of euros in 2018 due to the increase in the loan portfolio and finally (iv) Net Interest Income increased from 20.4 million euros to 25.3 million euros from 2018 to 2019 on account of the increase in the loan portfolio, which grew 74.8 million euros to 619.8 million euros.

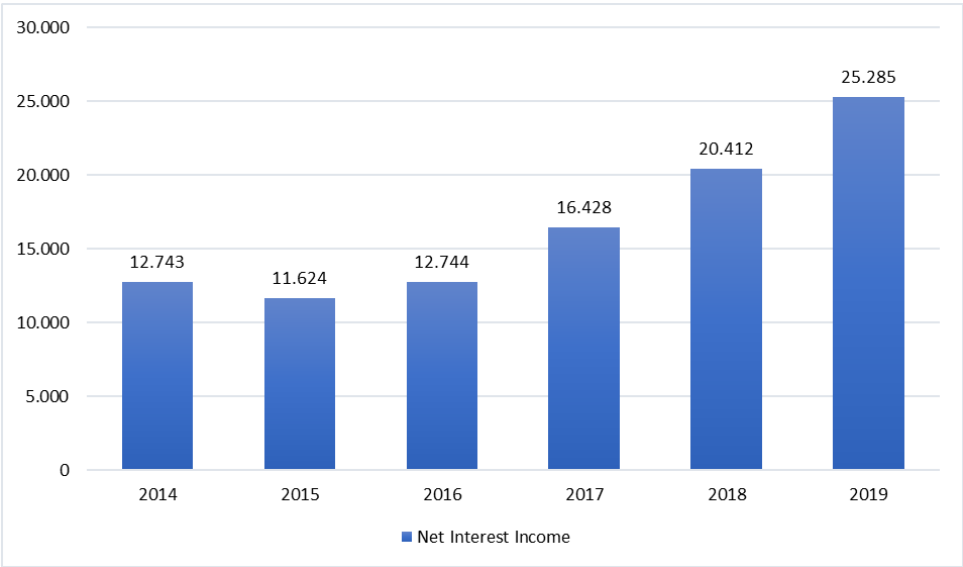


Figure XV - Net Interest Income evolution (in thousands)

Source: Annual Reports – 2014 to 2019

As well as Net Interest Income, Net Fees and Commissions Income has increase since 2015. There was a slight decrease in the first years analyzed (2014 to 2015) due to the 29,5% drop in the value of transactions in the secondary market for short-term shares (Euronext), as a result of the lower interest of investors in the Portuguese market. However, the increase in the number of the Bank's customers generated an increase in income associated with portfolio management, custody and distribution of investment funds. In the next years, 2015 to 2019 net commissions increased from 1.672 thousand of euros (2015) to 8.343 thousand of euros (2019), meaning a raise in 400%. The most significant reasons for the increase through the years are (i) significant increase in the Bank's customer number and operations carried out; (ii) start of BI Credit's activity in 2017; (iii) significant increase in brokerage and securities custody fees due to the good performance of Banco Invest in the market and the consequent greater appetite of Customers for these financial assets; (iv) increase of 12,7% and 68,6% in commissions on credit operations and services rendered, respectively and at last (v) increase in commissions for services rendered, which grew by 1.9 million euros (63.9%) in 2019.

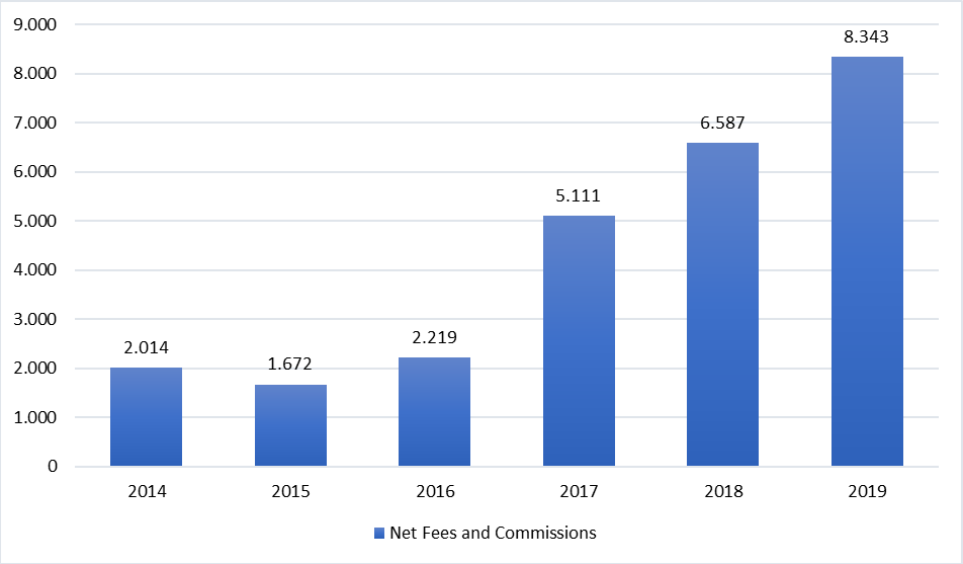


Figure XVI - Net Fees and Commissions evolution (in thousands)

Source: Annual Reports – 2014 to 2019

Net Income on Financial Operations reflect the gains and losses from financial assets and liabilities at fair value through profit or loss, from financial assets and liabilities through other operating income and results from currency revaluation. As we can see in the figure below, this value has been varying widely through the years, with a major decrease in 2018. In 2015, the amount of 7.4 million euros reflected the gains obtained from interest rate risks' management that resulted from the decrease in interest rates in the first quarter of the year, after which the Bank reduced its bond portfolio.[1] In the following year there was a decrease to 4.4 million euros, amount generated from managing credit portfolio and trading and securities portfolio available for sale. The Bank took advantage of the fall in the long-term interest rate to reduce its exposure to Portuguese public debt. In 2018 there was particularly worrying decrease in results from financial operations to -690 thousand of euros due to the increase in credit spreads that occurred in the financial markets. However, Banco Invest showed a notable growth in 2019, from -690 thousand of euros in 2018 to 4.5 million of euros in 2019. This performance was mainly supported by the gains recorded in valuation of assets portfolio recorded at fair value, which amounted 2.7 million euros, compared to the -2.2 million euros in the previous year.

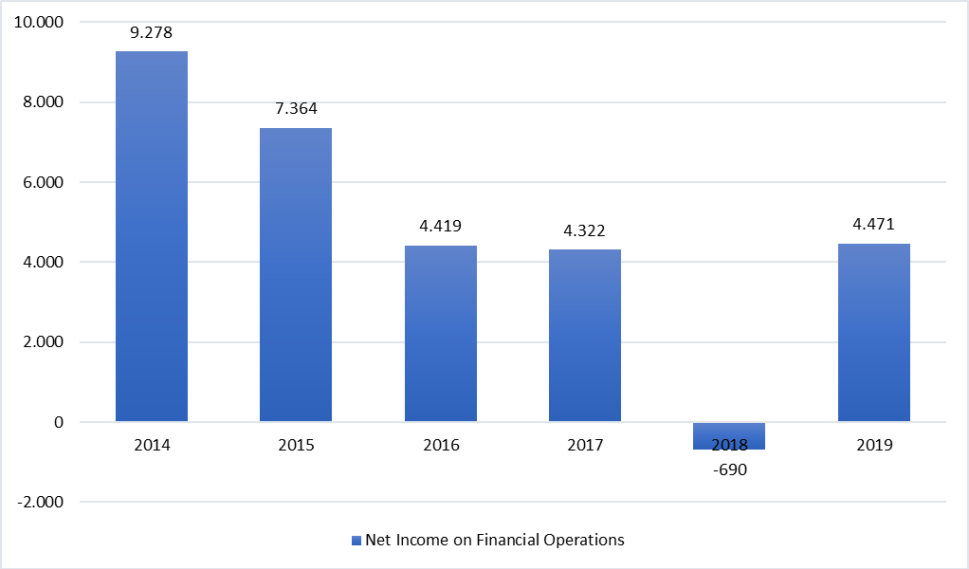


Figure XVII - Net Income on Financial Operations evolution (in thousands)

Source: Annual Reports – 2014 to 2019

As we can see in Figure VI, the net income decreased from 17.389.650€ (2014) to 11.690.869€ (2019), representing a fall of 33% in 6 years. It is the result of a performing and profitable pool of credits and the ability to financing at low rate levels. Analyzing the financial statements since 2014 until 2019, we can explain this 33% variation with 4 main reasons: (i) raise of around 13 million euros in interest income; (ii) net decrease of 15 million euros in some sources of income, such as dividend income (- 17 million euros), fees and commissions income (+ 7 million euros) and net income from assets and liabilities at fair value through other operating income (- 5 million euros); (iii) increase in 10 million euros in operating expenses, mainly due to the greater hiring of employees (increased from 127 to 273 employees) that represents an increase in staff costs of 6M€; (iv) and finally a decrease in 4 million euros of credit impairment.

[1] See Bravo and Silva (2006) for a detailed discussion of interest rate risk management models.

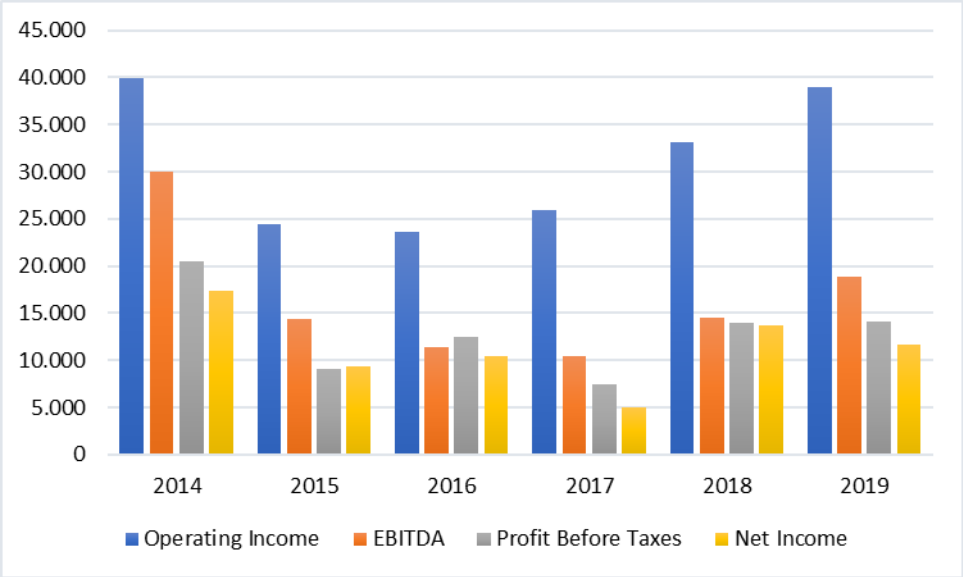


Figure XVIII - Income Statement evolution (in thousands)

Source: Annual Reports – 2014 to 2019

Efficiency ratio it is used to measure the performance of a company's short-term or current performance, this is, measures a company's ability to use its assets to generate income. Taking into consideration that the ratio is compute by dividing operating expenses (excluding interest) by operating revenue, a lower efficiency ratio means that a bank is operating better. An efficiency ratio of 50% or under is considered optimal.

As we can see below, the efficiency ratio shows a percentage of 58 in 2019 requiring more than 58% of the income as a cost to be able to generate it. Although it is slightly above the minimum advisable, we can conclude that the Banco Invest efficiency ratio is always around the value considered optimal.

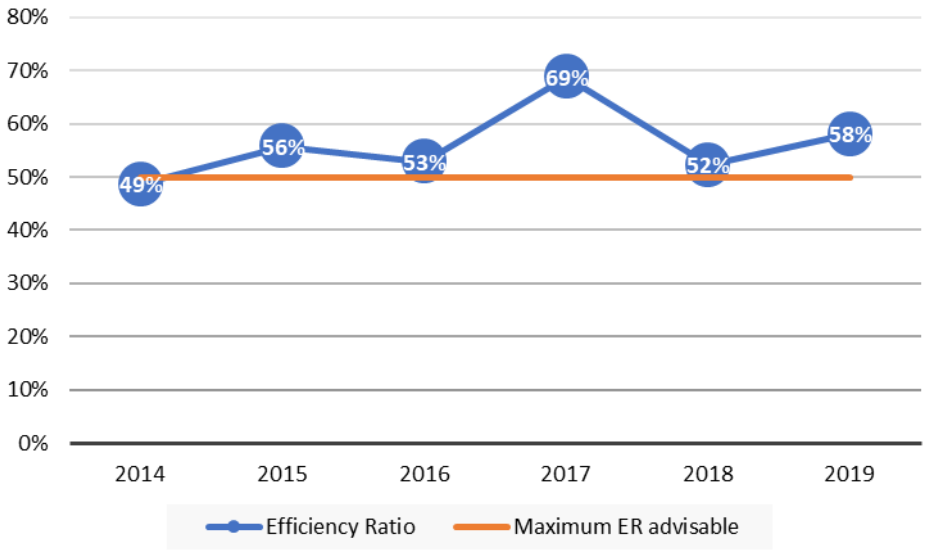


Figure XIX - Efficiency Ratio evolution

Source: Annual Reports – 2014 to 2019

The liquidity coverage ratio (LCR) refers to the proportion of highly liquid assets held by financial institutions, to ensure their ongoing ability to meet short-term obligations. This ratio is essentially a generic stress test that aims to anticipate market-wide shocks and make sure that financial institutions possess suitable capital preservation, to ride out any short-term liquidity disruptions, that may plague the market. The LCR is calculated by dividing a bank's high-quality liquid assets by its total net cash flows, over a 30-day stress period. The high-quality liquid assets include only those with a high potential to be converted easily and quickly into cash. Banks are required to hold an amount of high-quality liquid assets that's enough to fund cash outflows for 30 days. Thirty days was chosen because it was believed that in a financial crisis, a response to rescue the financial system from governments and central banks would typically occur within 30 days. The minimum requirement was set at 100% on 1 January 2019 by Basel III. (Committee, 2013). As we can observe, Banco Invest as always fulfilled the minimum LCR defined by Basel III, showing the public its capable management.

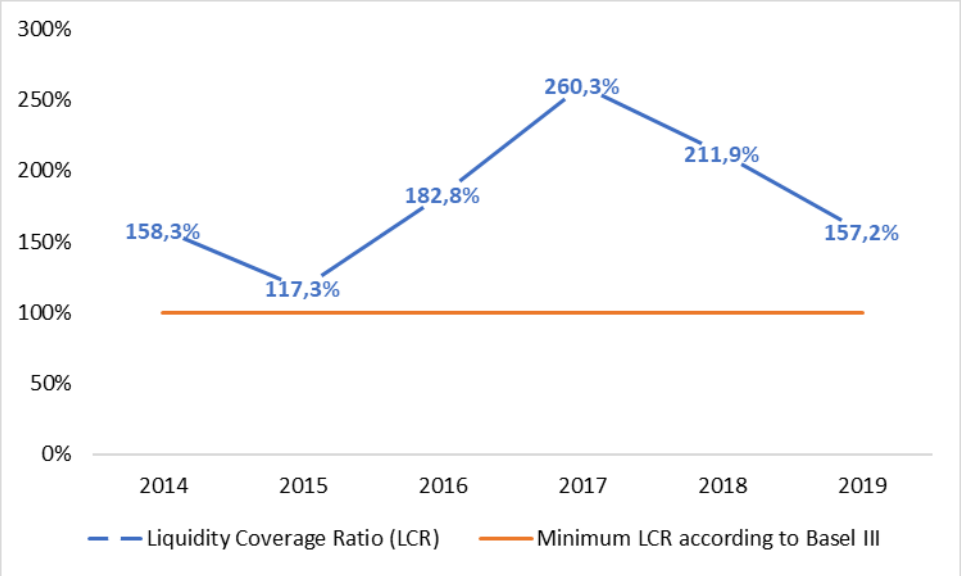


Figure XX - Liquidity Coverage Ratio evolution

Source: Annual Reports – 2014 to 2019

As we can see below, total assets have been increasing since 2014 (646.056.466€) until 2019 (842.313.377€). This raise of around 196 million of euros is mainly due to loans and advances to costumers, financial assets at amortized cost, financial assets at fair value though other operating income and cash and cash equivalents, which may cause liquidity problems for the bank. On the other hand, liabilities grew by 150 million euros, which does not appear proportional to the increase in assets, so it is expected to use own capital instead of borrowed capital. This growth is highlighted by the increase in customer accounts by 353 million euros and the reduction of central bank deposits by 178 million euros. In the last year, as for liabilities, the slight increase is due to the increase in deferred taxes, so it is not a question of contracting debts, but of predicting future positive results. Equity only increased in 46 million euros mainly due to other reserves (+60 million euros) and revaluation reserves (-8 million euros).

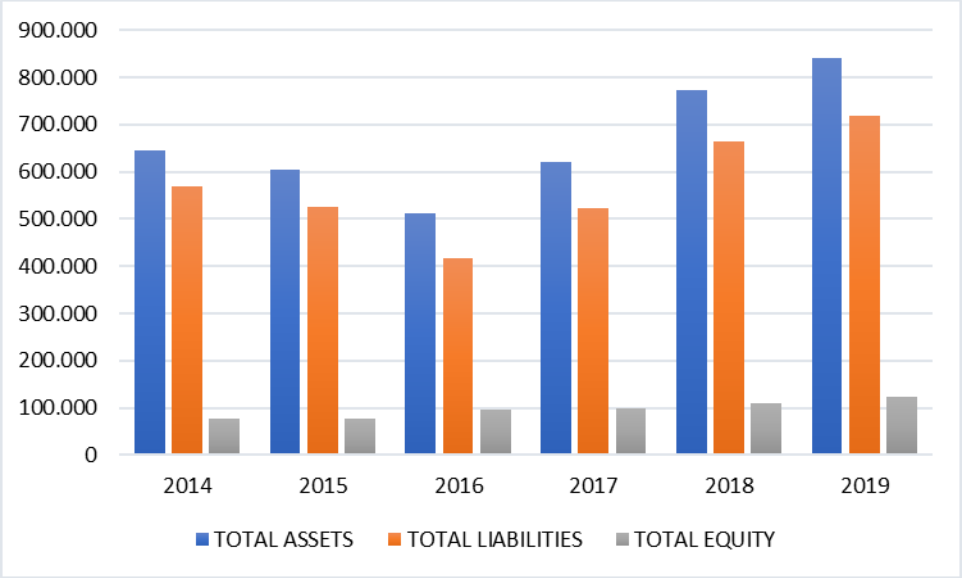


Figure IX - Balance Sheet evolution (in thousands)

Source: Annual Reports – 2014 to 2019

Figure XXI shows the evolution of the relationship established between the bank's liabilities and assets. Thus, in 2019, liabilities decreased despite investments made and the increase in assets. The ratio tends to decrease, so the entity's debt risk is lower, with a low degree of leverage, as investments are made using capital created by the bank and not with borrowed capital.

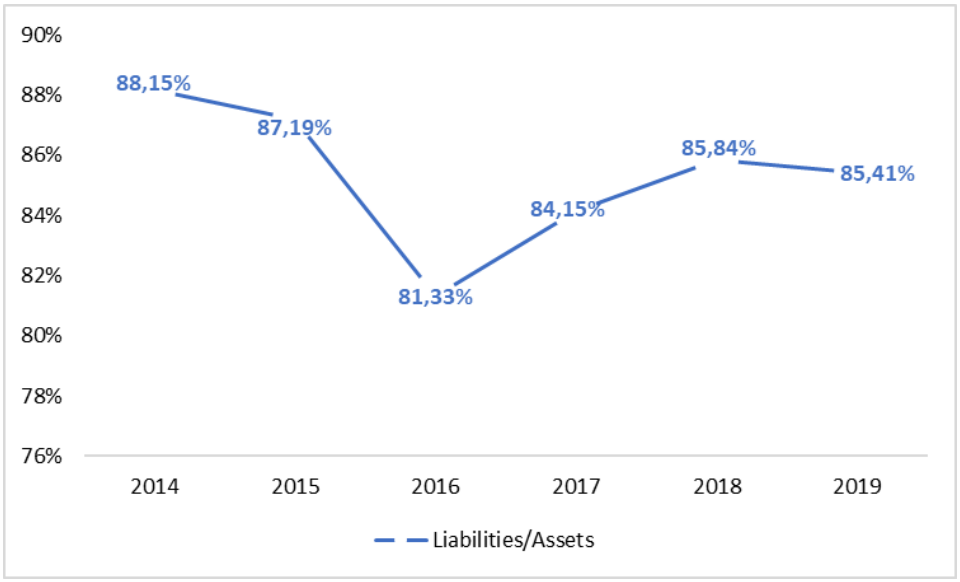


Figure XXI - Evolution of Liabilities/Assets ratio

Source: Annual Reports – 2014 to 2019

Through the years the liabilities structure changed a lot at Banco Invest. In 2014, the deposits portfolios were mostly Deposits from Central Banks (40%) and Deposits from Clients (55%). However, nowadays Central Bank Resources decreased by 178 million euros (reaching a weight of 6%) and deposits from clients showed a growth of 353 million euros (totalizing 94% of deposits portfolio).

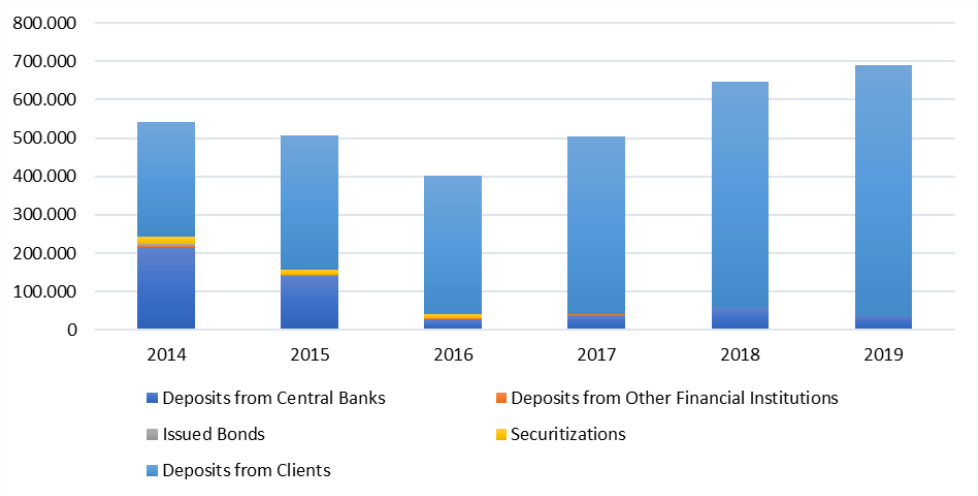


Figure XXII - Liabilities Structure evolution (in thousands)

Source: Annual Reports – 2014 to 2019

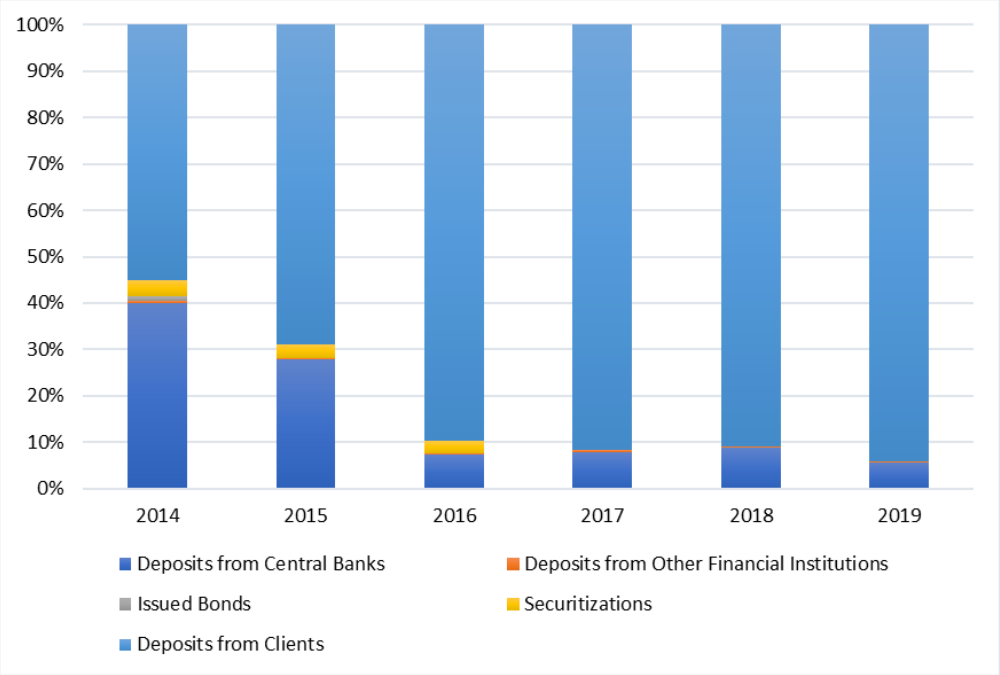
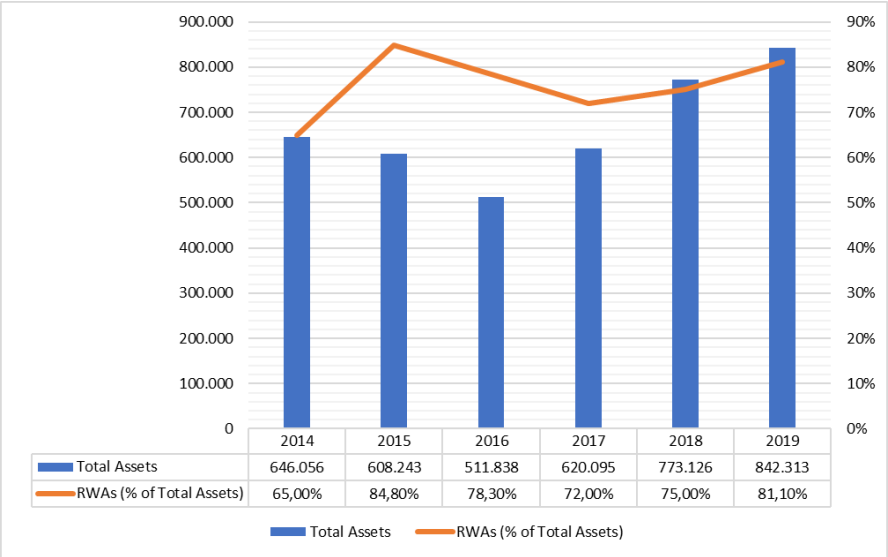


Figure XXIIII - Liabilities Structure evolution (in percentage)

Source: Annual Reports – 2014 to 2019

Risk-Weighted Assets are used to determine the minimum amount of capital that must be held by the banks to reduce the risk of insolvency. This term came from Basel III, a set of international banking regulations that forced some guidelines to avoid problems like the financial crisis from 2007-2008 and assumed that risk coefficients are determined based on the credit ratings of certain types of bank assets. For example, loans with collateral associated are less risky than others because the collateral is considered in addition to the source of repayment when calculating an asset's risk. The main goal is to prevent banks from losing large amounts of capital when a particular asset class declines sharply in value. Under Basel III, a bank's tier 1 must be a minimum of 10.5% of its risk-weighted assets (RWA). As we can see in figure XI, the minimum percentage of Tier 1 was and still is always fulfilled by Banco Invest.



	2014	2015	2016	2017	2018	2019
Total Assets	646.056	608.243	511.838	620.095	773.126	842.313
RWAs (% of Total Assets)	65,00%	84,80%	78,30%	72,00%	75,00%	81,10%

Figure XXIVI - RWAs evolution (in thousands and percentage)

Source: Annual Reports – 2014 to 2019

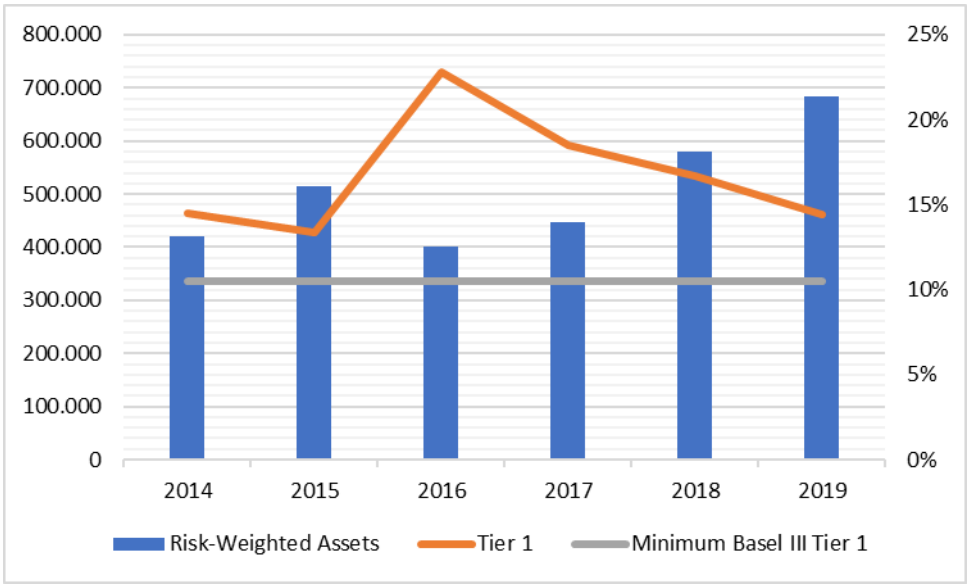


Figure XXV - Tier 1 and RWAs (in thousands)

Source: Annual Reports – 2014 to 2019

Ratio analysis is a technique used in financial analysis that allows expressing the relationships between different accounting elements. This form of analysis is advantageous, as the interpretation is easy and immediate, allowing to identify possible problems in the analyzed businesses. However, this technique loses relevance when the level of detail increases. On the other hand, it is necessary that all accounting procedures are executed correctly, since, if this does not occur, the use of indexes is not advantageous, as it does not present the real situation of the entity.

Some of the analyzed indexes intend to draw conclusions about the bank's profitability, evaluating whether it is profitable. Thus, the main indexes to be considered are ROCE (Return on Capital Employed) and gross margin. As for the ROCE, it is obtained by the ratio between the EBIT and the sum of the liability and equity. In this way, it is possible to draw conclusions about the efficiency and profitability of Banco Invest's capital investments.

The higher the value of the ROCE, the greater the gains recorded by the bank for each monetary unit invested and, therefore, the greater the bank's profit. Between 2018 and 2019, this indicator increased and therefore the value creation by the bank was greater. This situation shows an appropriate Banco Invest strategy that allows it to increase its profit and create value.

	2014	2015	2016	2017	2018	2019
Total Liabilities	569.530	526.003	416.279	521.791	663.639	719.434
Total Shareholders equity	76.526	77.251	95.559	98.303	109.486	122.880
TOTAL	**646.056**	**603.255**	**511.838**	**620.094**	**773.126**	**842.313**
EBIT	20.543	9.067	12.415	7.506	13.941	14.084
ROCE	**13,8940**	**12,4440**	**11,0660**	**8,8670**	**55,4585**	**59,8072**

Table VI - Return on Capital Employed evolution (in thousands)

5. VALUATION

5.1. METHODOLOGY

Drivers correspond to all the premises that affect cash flow and, consequently, the bank's value. Thus, Banco Invest must take as its driving force the aspects that most influence the bank's value, considering the financial activity developed. In other words, drivers correspond to the elements in which their variation significantly influences the bank's value.

At Banco Invest, one of the main factors corresponds to revenue from financial operations, which tends to increase significantly in the coming years, according to projections. On the other hand, the growth of this revenue must be considered. In terms of the international market, the drivers must be identical. In this case, the effects of exchange rates should always be considered.

In terms of costs, interest charges are considered the most important drivers. Another relevant cost concerns wage costs, which is necessary, having important personnel with high levels of technical quality and competence.

The bank's expected operating revenues increase on average over the years studied, and this increase is gradual. The increase in these revenues is due to the increase in revenues from financial operations carried out, since the number of financial operations is expected to increase. The largest cost component is expected to continue to relate to wages. Staff costs increase due to the increase in financial operations and the number of customers, which makes it necessary to employ more employees. In addition, the depreciation of assets appears more and more accentuated, as the use of intangible assets becomes increasingly necessary and accentuated.

From now on and in line with the methods stated during the Literature Review we can conclude that the Discounted Cash Flow methods are the most realistic and that deliveries the best theoretical results.

As mentioned previously, Banco Invest S.A. is a financial institution, making it difficult to separate financing and investment decisions from operating decisions, also very challenging because both working capital needs and the capital expenditures are low and the debt level is hard to estimate and finally due to high restrictions on behalf of regulatory authorities that establishes their decisions regarding capital allocation, growth and operations.

Therefore, for the Banco Invest valuation I am going to use the method that I think is the most suitable for this financial institution, the Free Cash Flow to Equity. As mentioned before, it is a very difficult method to apply, so, I am going to adapt the FCFE according to the reinvestment the firm need to meet their regulatory capital requirements. I will also value the bank through some relative valuation methods allowing me to compare the results obtained and consequently to conclude my research with a more reliable value.

As banks usually have stable cash flows, I find that a period of five years is sufficiently long to eliminate anu non-recurring results and not be biased, and so the following valuation is based on the historical data from 2015 to 2019 presented by Banco Invest in its revised annual reports. The forecasts are

estimated for the following 4 years, 2020 to 2023 and are based on the Simon Benninga valuation model (Benninga, 2008).

The model I will present was built by adapting the financial statements of Banco Invest S.A. to the Simon Benninga models by considering some critical assumptions and matching the BS line items to the Income Statement items to finally compute the Net Income results and to develop the Free Cash Flow to Equity.

In order to compute an equity value as of 31-12-2019 the terminal value was reached by using the Gordon Growth Method and all FCFE were discounted at the cost of equity, K*e*.

It is important to enhance that valuation process of financial institutions or any institution in general is a very complex and difficult process and the results ca be biased by the analyst opinion.

5.2. Assumptions and Results

To develop our analysis, we took into consideration the Simon Benninga assumptions.

For the Balance Sheet projections, we computed the cash as a percentage of deposits from the last five years a considered that the forecast will be the average of this amount. For the more significant assets such as trading securities, customer loans, other assets and other fixed assets we computed the annual growth rate of the last five years an consider this rate for the forecast.

For the liabilities side, more specifically the bank deposits, we computed the last five years growth and calculated the weighted average of the historical growth and the compound annual growth rate (as showed in table VI). For customer deposits rate it was considered a more conservative rate and a 50% haircut was applied.

Inputs	2015	2016	2017	2018	2019	Average
	0%	**10%**	**15%**	**25%**	**50%**	
Assets						
Cash as a percentage of deposits	0,79%	1,92%	1,81%	0,65%	3,58%	2,42%
Trading Securities and Others		-66,48%	34,54%	205,28%	-46,31%	3,56%
Grow of Customer Loans		-3,71%	43,58%	-5,07%	25,76%	13,35%
Other Assets		-33,36%	25,29%	-15,68%	-12,12%	-11,31%
Other Fixed Assets		41,64%	-20,86%	-4,38%	222,96%	36,40%
Liabilities						
Bank Deposits		-78,95%	40,49%	38,75%	-32,62%	-8,45%
Customer Deposits		2,78%	28,61%	27,10%	10,62%	16,76%
Other Liabilities		-19,98%	-35,90%	0,70%	72,85%	-2,79%
Marketable Debt Securities						0,00%

Table VII - Inputs

As for the Income Statement, more specifically in the Net Interest Income it was assumed that the growth in each type of interest would be the weighted average of the historical ratio between each interest and its respective products. For Other Income Items it was assumed the same weigh over Interest Income of 2019. For Other Expenses, it was assumed that it had the same weight over Net Interest Income of 2019. Personal Expenses was computed assuming the same weigh over Net Interest Income, the annual growth rate of the ratio number of employees divided by personal expenses of the last five years and the average Western Europe Growth Rate of the last five years and projections available for 2020 and 2021.

For the tax rate we considered the same ratio presented in 2019.

For the dividend's distribution, we considered a quarter of the dividend payout ratio of last five years. This haircut was due to the future expected effects of COVID-19.

In the current year, COVID-19 pandemic forced the banks to give the clients moratorium on their debts. Clients financial difficulties will lead then to a higher probability of default and, therefore, the bank will not be able to distribute as much dividends as in the last years.

Concerning the FCFE inputs, the risk-free rate considered was the 10 year German zero coupon bond -0,221%.

Regarding the leverage beta, βi, calculation we considered the following components:

(i) the debt to equity ratio was computed by subtracting deposits to the total liabilities and divide it by total equity;

(ii) the unlevered Beta of banking institutions was provided by Damodaran's website (Damodaran, 2019a);

(iii) as mentioned before, the tax rate considered was the same ratio presented in 2019;

(iv) and recurring to Damodaran's method we calculated the levered beta.

As showed before in equation 30, the cost of equity is calculated as below:

$$K_e = E(R_i) = R_f + \beta i\left[E(R_M) - R_f\right] + CRP$$

The market risk premium, R_M was given by Fernandez & Business (2018) and finally the Country Risk Premium used was the one provided by (Damodaran, 2019b).

Beta	
Unlevered Beta	0,4290
D/E Ratio	23,97%
Tax Rate	16,99%
Levered Beta	0,51
CAPM	
Beta	0,51
Rf	-0,22%
R_M	7,20%
Country Risk Premium	4,03%
Ke	7,51%

Table VIII - Cost of Equity

Following Damodaran mind, we decided to adapt the Free Cash Flow to Equity calculation to financial institutions such as Banco Invest and, therefore, we must compute the increase in regulatory capital (Investopedia, 2019). As mentioned before, RWA, risk-weighted assets are used to determine the minimum amount of capital that must be held by banks to reduce the risk of insolvency. The calculation of this amount is a very complex and confidential process to what we do not have access. Thence, we assumed that the asset variation was the same as the RWA.

Regulatory Capital	2019	2020	2021	2022	2023
Total Assets	842.313.377	904.677.563	972.989.336	1.050.525.577	1.140.511.405
Ratio	81,10%	81,10%	81,10%	81,10%	81,10%
Risk Weighted Assets	683.116.149	733.693.503	789.094.351	851.976.243	924.954.750
Solvency Ratio	15,00%	15,00%	15,00%	15,00%	15,00%
Equity to Maintain Capital Ratio	102.467.422	110.054.025	118.364.153	127.796.436	138.743.212
Increase in Regulatory Capital		7.586.603	8.310.127	9.432.284	10.946.776

Table IX - Regulatory Capital

As mentioned, the total capital with conservation buffer after 2019 is set to 10,5%. Therefore, to beware and above the capital regulatory requirements, we maintained the Banco Invest's solvency ratio of 2019 (15%) through the forecast until 2023. The increase in regulatory capital came from the retained earnings of each period.

For the growth rate in perpetuity we assume the average GDP growth rate in Western Europe of the last three years (2017 to 2019) and the projections available for 2020 and 2021. As mentioned before, the world is facing a crisis due to COVID-19. Therefore, we could not ignore the projections already available and studied, although negative, of the growth of the GDP for the coming years. This gave us a growth rate of 0,54%.

The number of shares outstanding were kept constant during the valuation.

The results are presented in the table below:

Valuation FCFE	2020	2021	2022	2023
Net Income	**11.837.784**	**12.954.388**	**14.186.390**	**15.551.370**
Net Capital Expenditures				
Equity to Maintain Capital Levels	7.586.603	8.310.127	9.432.284	10.946.776
Terminal Value				**66.399.198**
FCFE+TV	4.251.181	4.644.261	4.754.106	71.003.792
Discounted Value	3.954.139	4.017.921	3.825.570	53.143.627
Equity Value at 31/12/2019	**64.941.258**			

Number of Shares	11.900.000
Value per Share at 31-12-2019	5,46 €

Table X - Valuation

Taking into considerations all the assumptions made before we computed an equity value as of 31-12-2019 of 64.941.258€ which means that each share had a value of 5,46€.

The price target calculated is 8,4% above the traded market price at 31-12-2019.

5.3. SENSITIVITY ANALYSIS

To perform the sensitive analysis showed below, we chose as the most important variables of the model the Cost of Equity and the Growth Rate. In a *ceteris paribus* scenario, we can see through table X – Sensitive Analysis that an increase of 1,5% in the cost of equity to 9,01% represents a decrease of the target price in 19,3% (4,40€) and a decrease of 1,5% in the cost of equity reflects a 21,1% increase of the target price to 6,61€.

Regarding the changes in the growth rate scenarios, the fluctuations are even bigger. An increase of 0,30% in the growth rate reflects in a 33% increase of the target price.

We established as a rule a to develop the table below changes in the target price of 10%, i.e., as a good signal a target price above the market price in 10% (5,50€) and a bad signal a target price below the market price in 10% (4,50€). By analyzing the table below and with the idea in mind that all the assumptions made were result of the information available at the date we can conclude that the Buy recommendation is the best for Banco Invest.

Sensitive Analysis		Cost of Equity						
		6,01%	6,51%	7,01%	7,51%	8,01%	8,51%	9,01%
Growth Rate	0,24%	6,61 €	6,09 €	5,65 €	5,27 €	4,94 €	4,66 €	4,40 €
	0,34%	6,71 €	6,17 €	5,72 €	5,33 €	5,00 €	4,70 €	4,44 €
	0,44%	6,81 €	6,26 €	5,79 €	5,39 €	5,05 €	4,75 €	4,48 €
	0,54%	6,92 €	6,35 €	5,87 €	5,46 €	5,10 €	4,79 €	4,52 €
	0,64%	7,03 €	6,44 €	5,94 €	5,52 €	5,16 €	4,84 €	4,57 €
	0,74%	7,14 €	6,53 €	6,02 €	5,59 €	5,22 €	4,89 €	4,61 €
	0,84%	7,26 €	6,63 €	6,10 €	5,66 €	5,28 €	4,94 €	4,65 €

Table XI - Sensitive Analysis

6. CONCLUSIONS

The purpose of this thesis was to value one of the biggest investment Portuguese bank as of 31st of December of 2019 and compare it to the final price per share offered by the market.

During this study, Banco Invest proved to be a very solid and healthy bank, with an amazing capability to face market changes and continue to develop itself and give is clients the best products available.

In terms of rules laid down by the supervision entities as Basel III, there is a main focus on the capital retained by the financial institutions so that the latter have enough capital buffers to have a stable future. Concerning the Basel III framework, Banco Invest shows a solid CET1 capital ratio, well above the capital requirements for the fully implemented requirements in 2019. As we could see in the literature review performed above, different authors showed us that they have the same opinion about the various valuation' models. Through the years they discussed they advantages, limitations and the best results and methods used to achieve the most suitable value of a financial firm.

The present thesis aimed to study different valuation models for financial institutions with a view to choosing the best model to be applied to the Banco Invest valuation.

As mentioned before there are four approaches to valuation: The Discounted Cash Flow Valuation, Relative Valuation, Liquidation and Accounting Valuation and Contingent Claim Valuation. To choose the best way to value a financial institution we must consider accuracy and applicability criteria. We concluded that Discounted Cash Flow methods are easier to apply for firms whose cash flows are currently positive and can be forecasted with some reliability for future periods.

Through critical judgement and assumptions, it was possible to compute the net income results and use the methodology that in my opinion is the most suitable for Banco Invest valuation, the Free Cash Flow to Equity. This method was chosen as the best valuation method in terms of applicability, efficiency and forecasting. The application of this method to financial firms was a very challenging exercise in a way that the working capital and capital expenditures are very hard to estimate. Therefore, we adapted the FCFE according to the reinvestment the firm needs to meet their regulatory capital requirements.

Also related to the valuation process, we decided to apply the Simon Benning pro forma model, as so, we had to rearrange the financial lines from the Annual Report Balance Sheet and subsequently we applied the FCFE adaptation by Damodaran to reach the equity value. Taking into considerations all the assumptions made before we computed an equity value as of 31st of December of 2019 of 64.941.258€ which means that each share had a value of 5,46€. The actual price per share of Banco Invest is of 5,00€ and so the price target calculated is 8,4% above the traded market price.

Therefore, we can conclude that the financial firm is slightly undervalue and our recommendation is to Buy.

It is important to emphasize that the price per share computed is subject to changes depending on the economic evolution during the next few years, which has a high level of uncertainty due to recent events such as COVID-19 pandemic. With these recent events new regulations or relevant issues may appear that may have impact on Banco Invest accounts, meaning that a revision of the valuation should be done.

7. BIBLIOGRAPHY

Allen, F. (1990). The Market for Information and the Origin of Financial Intermediation. *Journal of Financial Intermediation*, *1*(1), 3–30. https://doi.org/10.1016/1042-9573(90)90006-2

Associação Portuguesa de Bancos. (2019). *Overview do Setor Bancário Português*.

Banco Invest. (n.d.). *Annual Report Banco Invest 2019*.

Benninga, S. (2008). *Financial Modeling* (3rd Editio).

Chamboko, R., & Bravo, J. M. (2020). *A Multi-State Approach to Modelling Intermediate Events and Multiple Mortgage Loan Outcomes. Risks*, 8, 64. https://doi.org/10.3390/risks8020064

Committee, B. (2013). *Basel III: The Liquidity Coverage Ratio and liquidity risk monitoring tools*. *January*.

Damodaran, A. (2006). Valuation approaches and metrics: A survey of the theory and evidence. *Foundations and Trends in Finance*, *1*(8), 693–784. https://doi.org/10.1561/0500000013

Damodaran, A. (2008). *What is the riskfree rate ? A Search for the Basic Building Block What is the riskfree rate ? A Search for the Basic Building Block*. *December*, 1–33.

Damodaran, A. (2009a). Breach of Trust: Valuing Financial Service Firms in the Post-Crisis Era. *SSRN Electronic Journal*, *April*, 1–34. https://doi.org/10.2139/ssrn.1798578

Damodaran, A. (2009b). *Valuing Financial Service Firms*. *April*, 1–34.

Damodaran, A. (2012). *Investment Valuation: Tools and Techniques for Determining the Value of Any Asset* (J. Wiley (ed.); Third). https://books.google.fr/books?id=ciJwGJfjHGkC&printsec=frontcover&dq=Investment+Valuation:+Tools+and+Techniques+for+Determining+the+Value+of+Any+Asset&hl=en&sa=X&ved=0ahUKEwihjoXR8qHnAhVRRBoKHScCCxkQ6AEIKzAA#v=onepage&q=Investment Valuation%3A Tools and T

Damodaran, A. (2015). *Applied Corporate Finance* (John Wiley & Sons (ed.); 4th Editio).

Damodaran, A. (2019a). *Damodaran's Unlevered Betas*. http://people.stern.nyu.edu/adamodar/New_Home_Page/datafile/Betas.html

Damodaran, A. (2019b). *Damoradan's CRP*. http://pages.stern.nyu.edu/~adamodar/New_Home_Page/datafile/ctryprem.html

Deev, O. (2011). *Methods of Bank Valuation: A Critical Overview*. *3*, 33–44.

Fernández, P. (2002). *Valuing companies by cash flow discounting: ten methods and nine theories*. *3*(451).

Fernandez, P., & Business, I. (2018). *Market Risk Premium and Risk-Free Rate used for 59 countries in 2018 : a survey*. 1–16.

Hitchner, J. R. (2011). *Financial Valuation: Applications and Models*. https://doi.org/10.1017/CBO9781107415324.004

Investopedia. (2019). *Risk-Weighted Assets*.

Koller, T., Goedhart, M., & Wessels, D. (2015). *Valuation: Measuring and managing the value of companies.* (6th Editio).

Monteiro, M. S. S. (2012). *Avaliação de Empresas: Aplicação do Método dos Fluxos de Caixa a uma PME*.

Pinto, J., Henry, E., Robinson, T. R., & Stowe, J. D. (2010). *Equity Asset Valuation*. https://books.google.com/books?id=YkFJ2SFs5fwC&pgis=1

Ross Levine. (2005). Finance and Growth: Theory and Evidence. *Handbook of Economic Growth*, *1*(SUPPL. PART A), 865–934. https://doi.org/10.1016/S1574-0684(05)01012-9

Ross Levine, N. L., & Beck, T. (2000). Financial Intermediation and Growth: Causality and Causes. *Journal of Monetary Economics*, *46*, 31–77.

Viebig, J., Poddig, T., & Varmaz, A. (2008). *Equity Valuation: Models from Leading Investment Banks*. https://books.google.fr/books?hl=pt-PT&lr=&id=1BHTBQAAQBAJ&oi=fnd&pg=PR5&dq=Equity+Valuation:+Models+from+Leading+Investment+Banks&ots=M6Ca8Si6mM&sig=-wnVSbDApZQNdu4JcJQ5M6CcPDs#v=onepage&q=Equity Valuation%3A Models from Leading Investment Banks&f=false

8. APPENDIX

Table XII - Banco Invest Integrated Report 2015 - 2019

Balance Sheet	2015	2016	2017	2018	2019
Assets					
Cash and deposits at central banks	3.869.780	7.479.406	9.144.414	4.233.345	24.689.525
Trading portfolio	44.669.608	35.999.394	48.307.443	58.042.047	44.767.031
Financial assets designated at FVTPL	0	0	0	22.505.715	22.662.720
Financial assets measured at FV OCI	0	0	0	98.761.930	80.789.349
Available for sale portfolio	165.202.404	103.123.101	86.185.114	0	0
Loans	241.528.206	238.269.213	336.672.955	326.412.782	410.959.027
Due from banks - sight deposits	3.282.287	3.839.502	6.424.253	11.713.894	17.633.710
Due from banks - time deposits	400.180	5.400.123	1.400.055	2.535.337	751.920
Customer loans	237.845.739	229.029.588	328.848.647	312.163.551	392.573.397
Investment portfolio held to maturity	100.115.289	86.496.783	101.902.862	232.878.450	227.233.417
Non-current assets held for sale	25.588.747	23.814.910	18.588.411	13.718.863	10.577.041
Associates	251.500	251.500	264.000	264.000	264.000
Tangible assets	2.302.312	3.044.931	2.381.835	2.277.253	7.890.879
Intangible assets	106.799	367.266	318.732	305.096	449.037
Tax assets	12.775.371	9.008.621	7.257.284	7.892.759	5.147.697
Other assets	6.844.824	3.982.892	9.070.935	5.833.668	6.883.654
Total Assets	**603.254.840**	**511.838.017**	**620.093.985**	**773.125.908**	**842.313.377**
Liabilities					
Financial liabilities at amortized cost	507.702.048	400.709.897	504.871.350	646.816.158	689.982.952
Due to central banks	141.006.232	29.000.000	39.180.000	56.680.000	39.180.000
Due to banks	1.486.255	988.912	2.951.525	1.775.690	206.895
Customer deposits	350.074.418	359.793.699	462.739.825	588.145.848	650.596.057
Financial Liabilities associated to transferred assets	15.135.143	10.927.286	0	214.620	0
Debt secutiries in issue	449.939	99.376	0	0	0
Financial liabilities held for trading	306.462	1.478.904	1.838.728	1.010.716	888.277
Provisions	2.794.981	0	0	24.723	1.605.670
Tax liabilities	1.245.429	2.245.024	955.542	241.127	815.264
Other liabilities	13.504.618	11.745.650	14.125.708	15.546.740	26.141.505
Total Liabilities	**526.003.477**	**416.278.851**	**521.791.328**	**663.639.464**	**719.433.668**
Equity					
Total Equity	**77.251.363**	**95.559.166**	**98.302.657**	**109.486.444**	**122.879.709**
Total Equity and Liabilities	**603.254.840**	**511.838.017**	**620.093.985**	**773.125.908**	**842.313.377**

Table XIII - Banco Invest Balance Sheet (Simon Benninga)

Balance Sheet	2015	2016	2017	2018	2019
Assets					
Cash	3.869.780	7.479.406	9.144.414	4.233.345	24.689.525
Trading account securities	44.669.608	35.999.394	48.307.443	80.547.762	67.429.751
Securities available for sales	190.791.151	126.938.011	104.773.525	13.718.863	10.577.041
Securities held to maturity	100.115.289	86.496.783	101.902.862	331.640.380	308.022.766
Customer Loans	237.845.739	229.029.588	328.848.647	312.163.551	392.573.397
Other Loans	3.682.467	9.239.625	7.824.308	14.249.231	18.385.630
Other Assets	19.871.695	13.243.013	16.592.219	13.990.427	12.295.351
Other Fixed Assests	2.409.111	3.412.197	2.700.567	2.582.349	8.339.916
Total Assets	**603.254.840**	**511.838.017**	**620.093.985**	**773.125.908**	**842.313.377**
Liabilities					
Banks Deposits	142.492.487	29.988.912	42.131.525	58.455.690	39.386.895
Customer Deposits	350.074.418	359.793.699	462.739.825	588.145.848	650.596.057
Marketable Debt Securities	449.939	99.376	0	0	0
Other Liabilities	32.986.633	26.396.864	16.919.978	17.037.926	29.450.716
Total Liabilities	**526.003.477**	**416.278.851**	**521.791.328**	**663.639.464**	**719.433.668**
Equity	77.251.363	95.559.166	98.302.657	109.486.444	122.879.709
Total Liabilities and Shareholder's Equity	**603.254.840**	**511.838.017**	**620.093.985**	**773.125.908**	**842.313.377**

Table XIV - Inputs (Forecast)

Inputs	2020F	2021F	2022F	2023F
Assets				
Cash as a percentage of deposits	2,42%	2,42%	2,42%	2,42%
Interest on Cash Balance	0,00%	0,00%	0,00%	0,00%
Grow/Interest on Trading Account Securities	3,56%	3,56%	3,56%	3,56%
Grow/Interest on Securities Available for sale	3,56%	3,56%	3,56%	3,56%
Grow/Interest on Securities Held to Maturity	3,56%	3,56%	3,56%	3,56%
Grow of Customer Loans	13,35%	13,35%	13,35%	13,35%
Interest of Customer Loans	5,02%	5,02%	5,02%	5,02%
Grow/Interest of Other Loans	0,00%	0,00%	0,00%	0,00%
Grow/Interest of Other Assets	-11,31%	-11,31%	-11,31%	-11,31%
Grow/Interest of Other Fixed Assets	6,00%	6,00%	6,00%	6,00%
Interest on Other Investments	0,00%	0,00%	0,00%	0,00%
Liabilities				
Grow of Bank Deposits	-8,45%	-8,45%	-8,45%	-8,45%
Interest of Bank Deposits	0,09%	0,09%	0,09%	0,09%
Grow of Customer Deposits	8,38%	8,38%	8,38%	8,38%
Interest of Customer Deposits	0,77%	0,77%	0,77%	0,77%
Grow of Marketable Debt Securities	0,00%	0,00%	0,00%	0,00%
Interest of Marketable Debt Securities	0,00%	0,00%	0,00%	0,00%
Grow of Other Liabilities	-1,40%	-1,40%	-1,40%	-1,40%
Interest of Other Liabilities	0,00%	0,00%	0,00%	0,00%
Interest on Other Loans	0,00%	0,00%	0,00%	0,00%
Income				
Fees and Commissions/Interest Income	24,43%	24,43%	24,43%	24,43%
Trading Income/Interest Income	13,09%	13,09%	13,09%	13,09%
Other Income/Interest Income	-0,23%	-0,23%	-0,23%	-0,23%
Personal Expenses/Net Interest Income	-44,50%	-44,50%	-44,50%	-44,50%
Other Expenses/Net Interest Income	-27,34%	-27,34%	-27,34%	-27,34%
Depreciation	-23,51%	-23,51%	-23,51%	-23,51%
Impairments	-0,78%	-0,78%	-0,78%	-0,78%
Provisions	-0,38%	-0,38%	-0,38%	-0,38%
Losses on Disposable Assets	0,00%	0,00%	0,00%	0,00%
Corporate Tax	-16,99%	-16,99%	-16,99%	-16,99%
Dividend Payout Ratio	2,11%	2,11%	2,11%	2,11%
Western Europe Growth Rate	0,99%	0,99%	0,99%	0,99%

Table XV - Balance Sheet (Forecast)

Balance Sheet	2019R	2020F	2021F	2022F	2023F
Assets					
Cash	24.689.525	17.909.570	19.263.633	20.743.538	22.358.782
Trading Account Securities	67.429.751	69.832.720	72.321.322	74.898.610	77.567.744
Securities available for sales	10.577.041	10.953.971	11.344.334	11.748.607	12.167.288
Securities held to maturity	308.022.766	318.999.658	330.367.730	342.140.921	354.333.669
Customer Loans	392.573.397	444.966.421	504.351.842	571.662.868	647.957.254
Other Loans	18.385.630	18.385.630	18.385.630	18.385.630	18.385.630
Other Assests	12.295.351	10.904.793	9.671.502	8.577.692	7.607.587
Other Investments	0	6.260.812	2.807.839	0	0
Other Fixed Assests	10.300.381	10.918.404	11.573.508	12.267.919	13.003.994
Accumulated Depreciation	-1.960.465	-4.454.416	-7.098.004	-9.900.208	-12.870.543
Total Assets	**842.313.377**	**904.677.563**	**972.989.336**	**1.050.525.577**	**1.140.511.405**
Liabilities					
Banks Deposits	39.386.895	36.060.321	33.014.705	30.226.319	27.673.438
Customer Deposits	650.596.057	705.110.476	764.192.741	828.225.596	897.623.861
Other Products	0	0	0	2.804.983	11.116.884
Marketable Debt Securities	0	0	0	0	0
Other Liabilities	29.450.716	29.039.171	28.633.376	28.233.253	27.838.720
Total Liabilities	**719.433.668**	**770.209.968**	**825.840.822**	**889.490.151**	**964.252.903**
Equity	109.486.443	109.486.443	109.486.443	109.486.443	109.486.443
Accumulated retained earnings	13.393.266	24.981.152	37.662.070	51.548.983	66.772.060
Total Equity	**122.879.709**	**134.467.595**	**147.148.513**	**161.035.426**	**176.258.503**
Total Liabilities and Shareholder's Equity	**842.313.377**	**904.677.563**	**972.989.336**	**1.050.525.577**	**1.140.511.405**

Table XVI - Income Statement (Forecast)

Income Statement	2019R	2020F	2021F	2022F	2023F
Interest Income					
Interest on Trading Account Securities		2.445.786	2.532.945	2.623.211	2.716.693
Interest on Securities available for sales		383.646	397.318	411.477	426.141
Interest on Securities held to maturity		11.172.482	11.570.631	11.982.970	12.410.002
Interest on Customer Loans		21.011.598	23.815.816	26.994.286	30.596.955
Interest on Other Assests		-1.311.924	-1.163.551	-1.031.957	-915.247
Interest on Other Fixed Assets		636.564	674.757	715.243	758.157
Total Interest Income	**34.152.291**	**34.338.151**	**37.827.917**	**41.695.229**	**45.992.702**
Interest Expense					
Interest on Banks Deposits		-32.623	-29.868	-27.345	-25.036
Interest on Customer Deposits		-5.194.735	-5.630.009	-6.101.756	-6.613.032
Interest on Marketable Debt Securities		0	0	0	0
Interest on Other Liabilities		0	0	0	0
Total Interest Expense	**-8.867.381**	**-5.227.358**	**-5.659.877**	**-6.129.102**	**-6.638.067**
Net Interest Income	**25.284.910**	**29.110.793**	**32.168.040**	**35.566.127**	**39.354.634**
Non-Interest Income					
Net fees and commissions	8.342.749	8.388.151	9.240.634	10.185.344	11.235.134
Trading income	4.470.718	4.495.048	4.951.877	5.458.129	6.020.691
Other operating income/expenses	-79.541	-79.974	-88.102	-97.109	-107.117
Total Non-Interest Income	**12.733.926**	**12.803.225**	**14.104.410**	**15.546.364**	**17.148.708**
Gross operating income	**38.018.836**	**41.914.019**	**46.272.450**	**51.112.491**	**56.503.342**
Personal Expenses	-11.252.670	-13.084.913	-14.459.104	-15.986.499	-17.689.382
Other Administrative Expenses	-6.914.134	-7.960.318	-8.796.319	-9.725.523	-10.761.486
Depreciation and Amortization	-1.960.465	-2.493.951	-2.643.588	-2.802.203	-2.970.336
Impairments	-3.223.901	-3.429.408	-3.867.849	-4.364.805	-4.928.084
Provisions	-1.580.947	-1.681.724	-1.896.728	-2.140.427	-2.416.650
Operating Profit	**13.086.719**	**13.263.705**	**14.608.861**	**16.093.034**	**17.737.404**
Gain/losses on disposals of assets	997.089	997.089	997.089	997.089	997.089
Profit before taxes	**14.083.808**	**14.260.794**	**15.605.950**	**17.090.123**	**18.734.493**
Corporate income tax	-2.392.939	-2.423.010	-2.651.562	-2.903.733	-3.183.123
Net income	**11.690.869**	**11.837.784**	**12.954.388**	**14.186.390**	**15.551.370**
Dividends	246.797	249.898	273.470	299.478	328.292
Retained Earnings	**11.444.072**	**11.587.886**	**12.680.918**	**13.886.913**	**15.223.077**